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An Interinstitutional Analysis of Faculty Teaching Load.

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AN INTERINSTITUTIONAL ANALYSIS OF FACULTY TEACHING LOAD

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The Department of Education

by
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ABSTRACT

Studies indicate that faculty salaries represent sixty to eighty percent of an institution of higher education's operating budget and that teaching load accounts for two-thirds of the total faculty effort. This study concerns itself with a university's largest budgeted resource: faculty, and more specifically, faculty teaching load.

With the projected decline in future enrollments and the growing concern for public accountability, the question of faculty teaching load and concomitant analysis becomes an increasingly more significant one. Many universities across the country are feeling the impact of declining enrollment combined with financial cutbacks; some, because of this, have resorted to haphazard measures in order to increase the student/faculty ratios and, therefore, cut costs. Speaking at the annual conference of the American Association for Higher Education in 1971, Clark Kerr stated the following:

> Cost-effectiveness of operations will be more carefully examined. If this is not done internally, it will be done externally by the "new experts" working for legislatures and governors.

This study is an example of the "internally done" research to which Kerr makes reference. It is based on a

two-year interinstitutional data exchange among fifteen cooperating universities in an attempt to determine whether or not significant differences exist in teaching loads among selected universities as measured by student credit hours produced by full-time equivalent faculty. The study used a concept of "limited comparability." Limited comparability takes into account institutional differences in definitions, elements, and methods and adjusts for these differences by using basic data rather than derived or precalculated data. Using basic rather than precalculated data, it was possible to select the more comparable sets of institutional data and to derive measures using a preferred basis or specific methodology. This concept was incorporated as a practical approach to deriving relatively comparable data despite differences in institutional data. The following questions were posited to aid in the investigation:

1. Are there significant differences in faculty teaching load among the different universities?

2. Are there significant differences in faculty teaching load within the disciplines among different universities?

3. Is there a significant interaction among the universities (i.e., do all levels of disciplines vary equally among the universities) based on SCH/FTE?

4. If differences exist within universities, is there a pattern to the differences?

The statistical model incorporated into the study was a multivariate analysis of variance with fixed effects and utilizing factorial arrangement of treatments. Pre-planned orthogonal contrasts were incorporated into the model.

The results indicated that the main effects of Institution and Division were each highly significant at the .0001 alpha level, as was the multivariate interaction and the year effect. The orthogonal contrasts were based on the division by institution interaction, however, some partial confounding was present due to missing cells.

Orthogonal comparisons indicated that Institutions One and Two were significantly different ($p < .05$) in eight out of eighteen compared divisions. Institutions Four and Five differed in only two of eighteen compared divisions. Correspondingly, when Institutions One and Two were compared with Institutions Three, Four, and Five six significant differences in mean faculty teaching load were found. The third comparison indicated that Institution Three differed from Four and Five in four divisions. Throughout the orthogonal comparisons the 0200s (Architecture), 0500s (Business), 0600s (Communications), 1000s (Fine Arts), 1300s (Home Economics), 1600s (Library Science) showed no significant differences; whereas, only the 1700s (Mathematics) showed significant differences in all four comparisons.

Whereas this study produced empirical results which indicate some similarity among universities, perhaps the real contribution of this study is in the overall methodology and interpretation of the results which easily lend to modeling by other institutions contemplating interinstitutional analysis.

Chapter 1

INTRODUCTION

While in recent years there has been an increasing interest in faculty workload analysis (and subsequently teaching load), and although hundreds of articles have been written on higher education faculty as a resource by an assortment of college and university administrators, federal and state agencies, and faculty, there have been relatively few studies that have been conducted on an interinstitutional basis. Further, there have been no published studies that deal directly with faculty teaching load differences in accordance with ranked faculty on an interinstitutional basis (Hesseldenz, 1976; Dressel, 1976).

While only concentrating on one aspect of faculty workload (i.e., teaching load), the research reported in this study represents an initial step in filling the void on faculty teaching load differences across institutions. The study is based on a two-year interinstitutional data exchange among fifteen cooperating universities associated with the Southern University Group of 25 (SUG).

Specifically, the study attempted to determine whether a differentiation existed among universities as to

teaching loads of ranked faculty based on an artificial grouping of academic structures (i.e., divisions by two digit Higher Education General Information Survey [HEGIS] code) with the dependent measure being the number of student credit hours produced during the fall semester per full-time equivalent faculty (SCH/FTE). For example, an administrator might make note of the fact that a typical music professor only produces 100 SCH's per semester, whereas the average production in the History department is over six hundred SCH's per professor per semester. Making note of this fact, the administrator might then want to compare the disparity in teaching loads with the teaching loads of other similar institutions to determine if this difference is constant among other universities (i.e., does the aforementioned 100 to 600 ratio exist among other universities as well).

Although this study was concerned mostly with ranked faculty, i.e., instructors, assistant professors, associate professors and professors, total faculty, the aforementioned plus lecturers, and graduate teaching assistants, was also considered. It was not, however, given equal emphasis in the analysis, and it was used mostly for interpreting the differences in ranked faculty if, indeed, there were any.

The significance of this study lies not only in the empirical results, but also in the overall methodology used in the study and the manner in which the results of this study were interpreted. The techniques and interpretations

lend themselves to modeling by other institutions contemplating interinstitutional analyses.

THE PROBLEM

Statement of the Problem

The purpose of this study was to analyze the faculty teaching load data both within and among the cooperating institutions.

The following questions were posited to guide in the analysis:

1. Are there significant differences in faculty teaching load among different universities?

2. Are there significant differences in faculty teaching load within the divisions among the different universities?

3. Is there a significant interaction among the universities (i.e., do all levels of divisions vary equally among the universities) based on faculty teaching load?

4. Is there a significant interaction among the universities when ranked faculty teaching load and total teaching load are considered?

5. Given a significant interaction, do the preplanned orthogonal comparisons isolate the significant differences between the institutions when compared by division?

Significance of the Study

In a memorandum to all vice-chancellors and academic deans dated April 17, 1975, Chancellor Paul Murrill of Louisiana State University (Baton Rouge) stated the following: ". . . If a faculty member has a lower than normal teaching load in a particular department, appropriate justification therefore should be briefly stated."

Chancellors and presidents of universities are not the only ones seeking justification for teaching loads. Considering that there are over 750,000 faculty in the nation's 2,500 universities, and, as faculty salaries represent 60 to 80 percent of an institution's operating budget (Romney, 1971), and because teaching load accounts for two-thirds of the total faculty effort, there is a growing concern for public accountability to the taxpayer (Romney and Manning, 1974). Speaking at the annual conference of the American Association for Higher Education, Kerr (1971) stated the following:

> Cost-effectiveness of operations will be more carefully examined. If this is not done internally, it will be done externally by the "new experts" working for legislatures and governors.

Another reason for analyzing faculty teaching load was that universities are being held accountable not only by the local taxpayer but also by the federal government (Dressel, 1974). The Southern Regional Educational Board (SREB) reported in 1976 that the federal government will experience problems in funding higher education in the

mid-1980's. In addition, the SREB reported the following in its Factbook on Higher Education (1976:8):

> . . . it is more likely that programs and institutions will be supported selectively and according to institutional strengths. . . . In addition, pruning and substituting programs will become more prevalent to minimize duplication.

The decline in college enrollments throughout the South is causing cutbacks in college and university programs. The SREB (1976) went on to report that the population of 18 to 24 year olds--the group that has dominated enrollment in the past--will be decreasing; subsequently, as student enrollment declines, the SREB saw a foreseeable need for fewer faculty members. Firnberg and Ahrens (1977) have projected a decline in enrollment of nearly 25 percent between the years 1981 and 1991 in the Louisiana State University System which, according to the January, 1977, edition of the Chronicle of Higher Education, is the twenty-third largest system of higher education in the nation.

Hodges (1977) reported the use of faculty teaching load data for allocating faculty resources to programs based on enrollment mixes. The October 3, 1977, Chronicle of Higher Education reported such a use of teaching load data at Lincoln University in Pennsylvania, where the President of the university was forced to raise the student-faculty ratio due to financial considerations.

In an address given at the 17th Annual Forum of the Association for Institutional Research in Montreal, the then

president of the association, James Firnberg, stated the following:

> Obviously, if cutbacks are to be made in budgets, the question of faculty teaching load will become an even more significant one. Institutions will have to look to compare the workloads of one university to that of others in order to measure faculty productivity.

Delimitations of the Study

This study was not a comprehensive study of the total faculty activity workload. It was only concerned with the budgeted and employed full time equivalent faculty (FTE) and the student credit hour production of that faculty and, as such, it did not take into account the following: preparation time for the class; evaluation time for the class; individual consulting; interaction with the students; research, scholarship, or creative activity of faculty members; public service; professional development; personal activities related to the university; or institutional service (e.g., meeting student activities, other organized activities, or general administrative functions) except as this was reflected by student credit hour production.

Technically, the accuracy of a set of data are determined by obtaining measurements of reliability and validity (Kerlinger, 1968). For the purpose of this faculty teaching load study, reliability was defined as the extent to which similar results would be obtained if measurements were taken at different time periods. The reliability of this study was contingent upon the clarity of the category definitions, the length of the time period studied, and

the representativeness of the time period studied.

Validity of the faculty workload study was viewed as the degree to which the reported time distribution of a faculty member corresponds to the way in which the time was actually spent. While most methods yield data that are relatively reliable, the validity of such data is questionable (Yuker, 1974). Romney (1971) reported that additional studies of the validity of faculty load data are badly needed, and that while many techniques might be used, an adaptation of the method of convergent and discriminant validity as described by Campbell and Fiske (1959) would seem to be most appropriate. The validity of this study was considerably enhanced by the elimination of subject bias in self reported data; the study used only budgeted information on the amount of time that faculty is employed in instruction and/or departmental research.

As the data on full-time equivalent faculty was not broken down by graduate and undergraduate levels, the study did not attempt to make comparisons based on a breakdown of faculty teaching load at these levels.

Definition of Terms

Full Time Equivalent Faculty (FTE).

A. Instructional Full Time Equivalent Faculty--the actual number (FTE) of faculty budgeted and employed in instruction and departmental research. Also included in this category were teaching grants, plus appropriate fractions of administrators who taught, plus appropriate

fractions of restricted fund salary of others who taught. Any faculty member with a full time appointment of 1.00 FTE, regardless of the period of time, i.e., full time, fall semester equaled 1.00 FTE; full time, academic year equaled 1.00 FTE.

(1) Ranked--those faculty holding the rank of instructor or above.

(2) Total--this category included ranked faculty plus graduate assistants, special lecturers, laboratory assistants, and other professional personnel charged to a teaching account.

B. Other FTE Faculty--included in this category were the appropriate FTE's of faculty charged or cross-charged to a separately budgeted research account. These FTE's were included only if the salary was paid from state general fund monies. Restricted grants and/or contracts were not included.

C. Total FTE Faculty--this is the sum of A and B.

FTE of Part Time Personnel. Graduate assistants and other part time instructional personnel were equated to full time on one of the following bases: (1) hours per week (e.g., a ten-hour per week appointment equaled .25 FTE or ten divided by forty; whereas a 20-hour per week appointment equaled .50 FTE, etc.) or (2) courses taught (e.g., a three credit hour course equaled .25 FTE, a six-hour course equaled .50 FTE, etc.).

Student Credit Hours (SCH). The number of students registered for a course times the credit hour value of the course (e.g., if thirty students were enrolled in a three-hour course, the instructor of that course would generate 90 SCHs). Auditors, credit by examination, correspondence, extension, or other SCHs for which faculty received additional compensation were excluded.

Student Credit Hours per Full Time Equivalent Faculty (SCH/FTE). A ratio created by dividing the student credit hour production of a faculty member (or department, division, university, etc.) by the appropriate FTE (e.g., a department within a university produces 10,000 SCHs and has a budget FTE faculty of 50, hence the SCH/FTE equaled 10,000/50 or 200). For the purpose of this study, SCH/FTE was indicative of faculty teaching load within a division and, as such, was utilized as the dependent measure in the analysis.

Course. An instructional activity, identified by discipline and by number, in which students may enroll, typically to earn academic credit applicable to a degree objective. This excluded "non-credit courses"; but included "zero-credit courses" which are requirements or prerequisites to degree programs and which were scheduled and consume institutional or departmental resources in the same manner as credit courses.

Instruction and Departmental Research (I&DR) Fiscal Account. An account from which the expenditures are intended to support instruction for the courses/sections of the discipline(s) for which the department is responsible and for activities associated with such instruction, including departmental research, advising of departmental majors, and others. In particular, the I&DR account provides the FTE for the ranked faculty and teaching assistants/associates who teach the courses of the department and engage in the associated activities.

Department. The smallest organizational unit of a university responsible for providing instruction, typically headed by a chairperson and identified by one or more I&DR fiscal accounts.

Discipline. The institutional name or subject matter identifier of a set of courses which are so separately identified by the institution and are offered by a department or, in some cases, by a set of departments which may be named on an interdepartmental basis. Most departments are responsible for a single discipline which is designated by the name of the department. Some departments are responsible for more than one discipline.

Discipline HEGIS Code(s). The one or more USOE Higher Education General Information Survey (HEGIS) taxonomy codes which identify in a standard manner the subject matter included in the courses of a discipline. The HEGIS

classification system designated divisions by the first two numbers of the four-digit code and the discipline within that division by the last two numbers (e.g., 0835--where 08_ stands for the division of education and the discipline within the division is designated by the last two digits 35; hence 0835 stands for the division of education, the discipline of Health and Physical Education). A two-digit HEGIS number refers to the first two numbers of the four-digit code and denotes a division; whereas, a four-digit HEGIS number refers to not only the division (the first two digits) but also to the discipline within that division (the last two digits). HEGIS codes are assigned to disciplines to facilitate arraying exchanged data in compatible categories. (See Appendix A.)

Student Level. For reporting credit enrollment measures by level of student the categories are: FR-SO, freshman-sophomore; JR-SR, junior-senior; MAST, master and first professional; and DOCT, doctoral.

Census Date. Normally, an institution's census date for the fall semester represents the final date for adding and for dropping classes without penalty of a grade, and it is the point estimate for the total SCH production of the faculty for the fall semester and, as such, served as the date for computation for the exchange. At Louisiana State University it is the fourteenth class day, while at other universities it may range from the twelfth to fourteenth class day.

Chapter 2

REVIEW OF RELATED LITERATURE

In his annual report (1976), President Wilson H. Elkins of the University of Maryland stated:

> It is paradoxical that in the anniversary celebration of independence the value of higher education was being questioned and even disparaged. What is the trouble? Why are colleges and universities, including the University of Maryland, having to struggle for adequate support and why is there public concern and some disenchantment? . . . Why, after centuries of experience, has accountability taken the form of time keeping for the faculty? The answers to these and other questions will affect the future welfare of this and other universities.

Beginning with the first study of faculty workload of major significance published in 1919 by Koos (Yuker, 1974), President Elkins' sentiments have been echoed for nearly fifty years by researchers of higher education. The purpose of this review of related literature was to show an overall perspective of the problems of faculty activity analysis which, as Bunnell (1960:92) suggests, has a solution that is "both impossible and imperative."

The first part of this review was concerned with an historical overview of faculty workload analysis; beginning with the Koos study in 1919, it chronologically dealt with publications to 1976.

It was found that fairly extensive discussions as to the purposes of studying workload and as to the uses of faculty workload data, or both, were included; therefore, the second section on the uses and purposes of studying faculty workload was included.

The last section in the review dealt with the measures of faculty workload based on institutional data, so that the assumptions and the limitations of each could be compared and contrasted.

Historical Overview of Faculty Workload Analysis

In a monograph published by the Bureau of Education of the United States Department of the Interior in 1919, Koos made the following statement: "Tradition, sentiment, rule-of-thumb and temporizing compromise--these have been, and unfortunately still are, the dominant methods used in educational administration" (Koos, 1919:5).

Seemingly, little has been done since in the "adoption of standardized 'scientific' methods for the determination of faculty workloads" (Yuker, 1974:4) or, even in trying to bring about changes (Stecklein, 1960).

Following the Koos study, which set out to obtain answers to questions regarding the influence of various factors on teaching loads, several studies were conducted during the 1920's, of which, Yuker (1974) deemed the following as probably most important: Davis (1924), Kelly (1926), and Ayer (1929).

In what Miller (1968:109) chose to call the "Chicago" school, a group of faculty members at the University of Chicago, in the late 1920's and early 1930's, conducted a series of multi-institutional studies. The results of these studies were summarized in a book by Reeves and Russell (1933:31) when they said:

> The evaluation of faculty load is an extremely difficult problem. Teaching duties and other professional duties vary tremendously from institution to institution and from individual to individual within a given institution. In fact, the factors involved in determining total faculty load are so numerous and so varied as almost to preclude precise determination by any mechanical method. No thoroughly scientific method of measuring faculty load is now available. Existing measures are unsatisfactory and incomplete. The answers are not yet in. Yet, as a practical necessity, some method of measuring and adjusting faculty load even though only approximate must be employed.

Two studies frequently referenced in comparing faculty workload among the disciplines were conducted by Stewart (1934) and Knowles and White (1939).

During the years 1939 to 1950, there was little done in the area of faculty activity analysis or in institutional analysis. The intervention of the Second World War and the post-war veterans' enrollment boom consumed most of the institutional energies (Miller, 1968). In the early 1950's with a decline in veteran enrollment, many universities lost the financial support under the G.I. Bill and the public was increasingly called upon to support higher education; commensurate with the increased public investment, there was an increasing demand for accountability and Romney (1971:13) stated that most of the attention in research of higher

education was devoted to the following:

1. Bringing about significant improvements in faculty salary compensation and in the relative economic position of the faculty.

2. Gaining an understanding of the components of faculty workload.

3. Obtaining sufficient faculty to meet demands.

Romney (1971:14) based the justification for these investigations on the following basic assumptions:

1. That certain kinds of faculty activities somehow are related to the quality of the learning environment created by the institution.

2. That mixes of faculty workloads influence the costs of producing the learning environment.

The Encyclopedia of Educational Research contained articles on faculty workload in its 1941, 1950, and 1960 editions (Douglass and Gruhn, 1941; Douglass and Romine, 1950; and Lambert and Iwamato, 1960); however, their value is limited as little updating occurred and the articles were mostly concerned with elementary and secondary education. The most recent edition (Ebel, 1971) carried no articles that deal with faculty workload.

From the late 1950's up until the present, there have been numerous studies conducted by individual institutions. The most publicized of these include the Ohio Study (1970) which reviewed over one hundred studies and included a rather comprehensive survey of faculty resource analyses (Romney, 1971). The University of California (1970) study was designed to show differences among disciplines within a university. Data from this study showed 49 percent of the

total university faculty taught nine or more course contact hours; in the physical sciences only 22 percent taught nine or more compared to 55 percent in the social sciences and 63 percent in arts and letters.

In 1959, a two-day conference was held at Purdue University on faculty workload. The papers presented at this conference were published by Bunnell (1960). This monograph included several important papers: methods of analyzing faculty workload by Stecklein (1960), uses of faculty load data in interinstitutional analysis by Blee (1960), and an extensive bibliography of faculty load by Stickler (1960).

Stecklein characterized the importance of the 1959 conference when in his opening statement he suggested that there was a growing "need for more meetings like the one we are having today" (Bunnell, 1960:26).

In 1971, reports were published by Lorents and by Romney. The work by Lorents contained a thorough review of the literature, as well as, a description of the results of an extensive study using a time sampling technique first proposed in an article by Ritchey (1959). Romney's study described the work being done by a Faculty Activity Analysis Task Force under the auspices of the National Center for Higher Education Management Systems (NCHEMS) at the Western Interstate Commission for Higher Education (WICHE). The report by Romney was the first in a series of three to attempt to describe the faculty activity analysis

approach (Romney, 1971; Manning and Romney, 1973; Manning, 1974).

Throughout the 1960's and the 1970's many outside environmental factors have influenced the studies of faculty workload and interinstitutional analysis. Peterson (1976: viii) cited some of the sources of outside pressure:

> The recent prominence of issues of desegration, affirmative action, consumerism, collective bargaining, and accountability has led to quasi-legal precedents and pressures. . . . The 1964 Civil Rights Act provided for the collection of racial data on enrollments; aid to disadvantaged students has been the subject of policy analysis at state and federal levels; sex discrimination has added another dimension to inter-institutional reporting about students and staff; and the consumer movement is encouraging the publication of institutional data on a variety of characteristics to aid students in their selection of a college. The advent of collective bargaining has spurred improved record keeping, more sharing of information among institutions involved in common bargaining arrangements, and public access to resource data. Perhaps, most pervasively, the issue accountability has spurred the growth of ever more detailed data gathering and reporting about enrollments, resources, effort, and productivity.

The recent rise of national agencies such as the National Center for Educational Statistics (NCES) and the National Center for Higher Education Management Systems (NCHEMS) has been predominant in aiding interinstitutional analysis (Peterson, 1976).

At the same time, the federal government, particularly through the Higher Education Facilities Act of 1963 and the subsequent general higher education support programs, gave added impetus to the formation of state coordinating agencies (Dressel, 1974). The organization of the Higher Education General Information Survey clarified the need for uniform,

consistent, and compatible systems of reporting data through the states to the federal level (Drews and Drews, 1969).

Concommitant with the emergence of environmental factors and national agencies, there has also been increasing emphasis by state agencies and professional associations on reporting interinstitutional data on faculty workloads.

One of the more prominent of these national associations is the Association for Institutional Research (AIR). AIR began informally and then eventually became an international organization with its purposes being to elaborate the subspecialty of institutional research and to provide outlets for various types of research studies (Dressel, 1974:29).

Since 1975 AIR has sponsored a quarterly source book series New Directions for Institutional Research, which has produced several studies on the importance of faculty workload analysis (Wallhaus, 1976; Kirschling and Staaf, 1976; Witmer, 1976; Dressel and Simon, 1976).

In the winter 1976 edition of New Directions for Institutional Research, Peterson focused concern on interinstitutional research. This issue contained a review and critique of standardized instruments with currently available institutional norms (Pace, 1976) and a case study of interinstitutional research projects (Mims and Lelong, 1976) among others.

Uses and Purposes of Studying Faculty Workload

In his second report on faculty activity analysis, Romney (1971:65) stated:

> Purposes for gathering data concerning the faculty resources have been almost as abundant as the number of studies. Historically, concerns were focused on simple inquiry as to what faculty do. Recently, the studies have been much more sophisticated investigations of the utilization of faculty as an institutional resource.

As Romney pointed out, there are many discussions as to the uses and purposes of studying faculty workload and some are fairly extensive (Cannell, 1959; Blee, 1960; Doi, 1961; Stecklein, 1961; Henle, 1967; Hauck, 1969; Hill, 1969; Lorents, 1971; and Romney, 1971). Yuker (1974) combined the lists of several authors and came up with twenty-five seemingly different items. Yuker (1974), Doi (1961) and Romney (1971) among others, felt that the listing of purposes was of little utility, and that a listing of questions to be answered by the study would be more useful than a philosophical discussion of purpose. One commonly used list of questions to be answered by a study, that is fairly comprehensive in scope, was presented by Stecklein (1961):

> 1. What is the total fulltime equivalent staff devoted to instruction, research, administration, student counseling, and public and professional services?
>
> 2. What is the relationship between type of instruction and the time spent on various phases of instruction as well as the total time devoted to the instruction?
>
> 3. What is the average percentage of time spent by faculty members at each rank on the various levels

of instruction and the various types of instruction?

4. What proportion of time do faculty members at each rank devote to instruction, research, administrative duties, student services, public services?

5. What differences exist between departments in the percent of faculty time devoted to the several functions?

6. What is the total work week for faculty members by rank and/or by department?

7. What is the fulltime equivalent staff per student credit hour?

8. What is the relationship between credit hour or class hour and amount of time devoted to instruction at the various ranks?

Durham (1960) and Stecklein (1961) have noted that data used in faculty workload studies is often misused, with the most common issue being the use of such data in determining faculty salaries, load, promotions, and tenure. Blee (1960:47) agrees with Durham and Stecklein; however, he brings in another point when he stated: "While coordinating decisions require something more than faculty workload data, nonetheless, faculty workload data is essential in making those decisions."

Measures of Faculty Workload Based on Institutional Data

The major measures found in institutional records for measuring faculty workload are: credit hours, class or contact hours, and student credit hours.

The workload of a faculty member is most often described in credit hours taught (Simmons, 1970). It is assumed that there is a constant ratio between credit-hour

load and the total workload (Stickler, 1960). However, many studies show that the ratio of total hours worked to credit hours is not constant. In studies by Ayer (1929), Stewart (1934), Michell (1937), Knowles and White (1939), and Woodburne (1958), among others, the ratio of total hours to credit hours varied from two to eight. The Ohio Study (Ohio Inter-University . . . 1970:8) stated:

> Clearly the conclusion of virtually all studies from 1929 to 1959 was that neither credit hour, contact hour, student credit hours or student contact hours were by themselves, or together, reliable indicators of faculty member's workloads. . . . In short, the use of the "Credit Hour" as a standard criterion for evaluating an individual's contribution to the work of his university is even less appropriate now than it was ten years ago and it was clearly inappropriate then.

According to the National Education Association (1972), contact hours ranked second only to semester hours as a base for defining load. Contact hours include adjustments for laboratories, studies, and courses that meet more or less than the stated number of credit hours (e.g., a professor meets with a three-credit-hour class four times a week for one hour--he is credited with three semester hours and/or four contact hours). Again, as Simmons (1970), Williams (1970), and Romney (1970) point out, despite the slight improvements, they share the same faults as the credit hour and should not be used as the primary measure of faculty workload.

The shortcomings of the semester and contact hour have been improved upon by the use of multi-factor ratios (Hay, 1970). Carter (1969:43) stated that:

> Ratios such as student-faculty credit hour load are well established indicators of the public domain and would be difficult to replace. In spite of their disturbing inadequacies, they can be used as a point of departure for explaining the full function of a modern university to its now publics.

Investigators such as Durham (1960) and Doi (1961) proposed that faculty workload should be measured as the number of student credit hours per fulltime equivalent faculty member (SCH/FTE). They consider this the best single measure of the efficiency of a faculty member. If this were used as a standard, it would make possible comparisons among different departments, schools or universities. Durham (1960) made the statement that if data were to be collected then analyzed from different universities on faculty workload, that the best measure was the SCH/FTE if common definitions and data collection techniques were employed.

Like the contact hour and the credit hour, the SCH/FTE has its drawbacks as pointed out by Toombs (1973). It concentrates on the instructional function of faculty, ignoring other activities such as research and administration.

While not generally used as a measure of faculty workload, the student-faculty ratio is occasionally used as a measure of institutional quality. Yet, there is little evidence to indicate it is an accurate measure of either. Ruml and Morrison (1959:10) said:

> The idea that the lower the over-all ratio of students to teacher, the better quality is sheer fantasy . . . the assumption that the lower the ratio of student to teacher in particular subjects, the higher the quality of instruction has never been substantiated.

Chapter 3

METHODOLOGY OF THE STUDY

At the annual meeting of the Southern University Group of 25 (SUG) held in Atlanta, Georgia, in October of 1975, it was decided that cooperating universities within the group would exchange data on faculty teaching load and that the Louisiana State University System would serve as the host institution for the data exchange. It was from this two-year data exchange that this study received its data.

The Sample

The following institutions participated in the data exchange: Texas A & M (Bryan), University of Alabama (Birmingham), Louisiana State University (Baton Rouge), University of Kentucky (Lexington), University of South Carolina (Columbia), Virginia Polytechnic Institute (Blackburg), University of Tennessee (Knoxville), North Carolina State (Raleigh), University of New Orleans, University of Texas (Austin), University of Alabama (Tuscaloosa), University of Arkansas (Fayetteville), West Virginia University (Morgantown), Mississippi State University (Starkville), and Florida State University (Tallahassee).

From the aforementioned institutions only five institutions were used in the study and the others were excluded for the following reasons: incompatability of data reported as quarter hours with semester hours; inconsistency of data reported over a two-year period; data reported for only one year (minimum of two years data needed to calculate means for the analysis); and the data were reported in terms too general to be of use to this study (e.g., FTE faculty was not broken down by ranked, other, and total). The sample for this study consisted of five participating universities in the data exchange who must remain anonymous due to the confidentiality of the exchanged information. Individual institutional data are distinguished only through the use of numeric codes (e.g., Institution One, Two, etc.). (See Appendix C for a profile of each participating institution.)

The Overall Operating Procedure Used in the Data Exchange

Figure 1 shows the general operating procedure used in the collection of data and in the dissemination of reports for the study. Participants were first identified and then definitions were determined. Next, load sheets and credit enrollment forms were designed (see Appendices D and E) for the tabulation of the data to be used in the exchange. These forms were then forwarded to the participating institutions with instructions on how to prepare them. The completed load sheets were then returned to LSU to be coded and subsequently punched onto IBM cards. Printouts of the raw

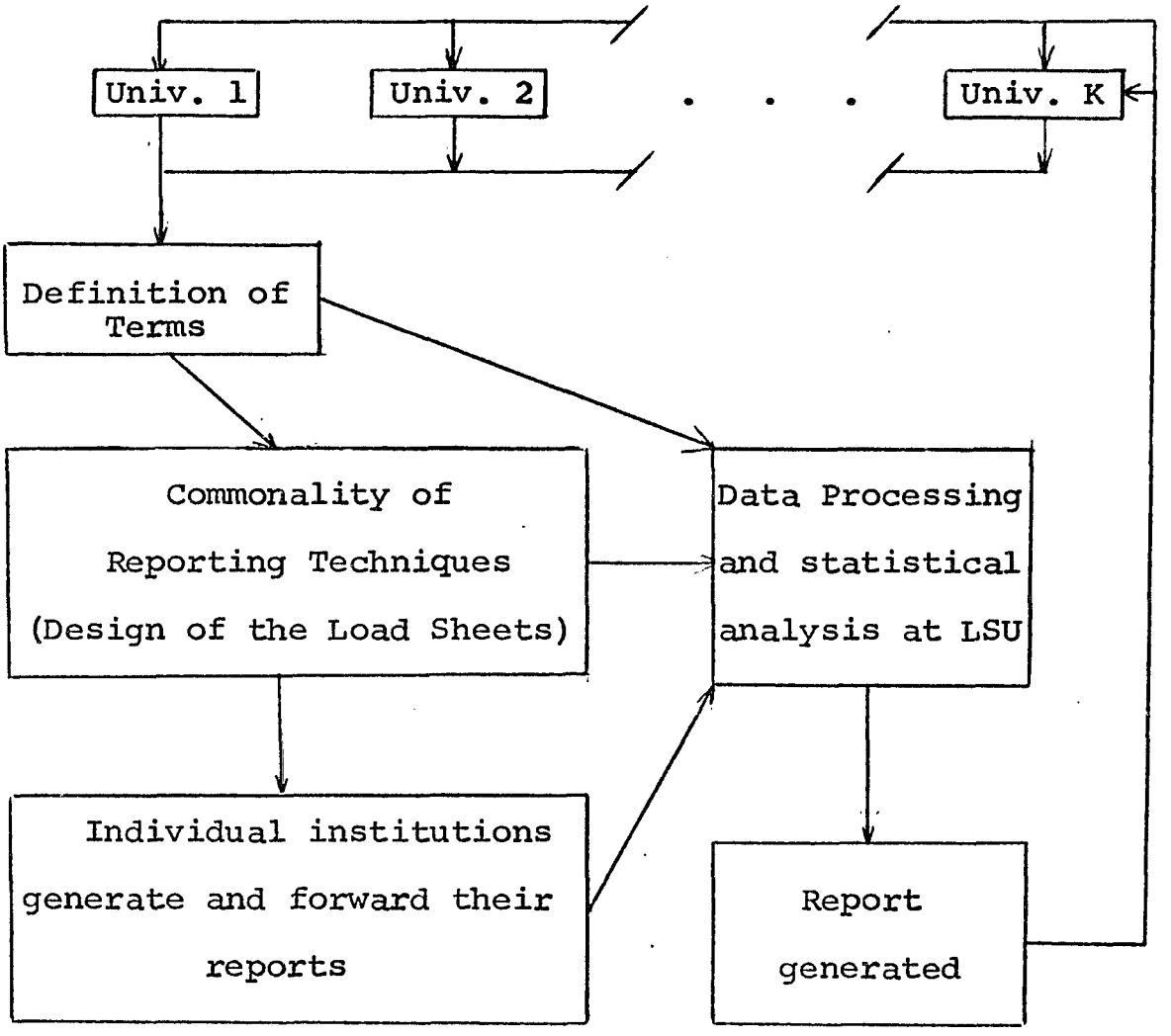

Figure 1. General Operating Procedure

data were generated on the computer and sent to the participants for editing. Following the edit procedure, the data were then converted to magnetic tape and made available to the participants. The SUG data exchange was an informal operation and, as such, no information or analytical reports

were prepared by the SUG group per se; instead, such reports were left to the individual institutions to prepare if they so desired. It should be noted that the data only represents the teaching load as reflected on the fall semester census date of a particular institution for a given year.

The Concept of "Limited Comparability" and the Assumptions Underlying the Basic Intent of Instrumentation

The study used a concept of "limited comparability" which took into account institutional differences in definitions, elements, and methods, and adjusted for these differences by using basic data rather than derived or precalculated data. Using basic data, rather than precalculated data, it was possible to select the more comparable sets of institutional data and to derive specific data measures (e.g., SCH/FTE) as needed. This concept was incorporated as a practical approach to deriving relatively comparable data despite differences in institutional data.

The Specific Operating Procedure and Assumptions Underlying the Basic Intent of the Study

Credit enrollment forms were developed for each institution for distribution among the various departments. The credit enrollment forms were ultimately used in the preparation of the load sheets (i.e., each university completed a credit enrollment form, then collected and tabulated these forms onto load sheets for distribution to

the host institution, in this case LSU). The reporting of student credit hours and instructional FTE were provided for on each form. The assumptions underlying the forms were (1) that a department was identified by a "general fund" Instructional and Departmental Research (I & DR) account and (2) that expenditures from this account were intended to support instruction for the course/sections of the discipline(s) for which the department was responsible and for activities associated with such instruction, to include departmental research. In particular, the I & DR account provides the FTE for the Ranked Faculty (RF) and Teaching Assistants (TA) who taught the courses of the department or who were engaged in associated departmental research.

The basic intent of the credit enrollment form was that it contained data representing the situation in which the FTE faculty shown, teach all of the course sections of a department and no other. More specifically, the intent was that the FTE shown consist of the combination of (1) total FTE of I & DR faculty in the given department, including all non-teaching portions of faculty, minus any prorated portions of FTE for the teaching course sections reflected in credit enrollment data for other academic departments and (2) the inclusion of any FTE faculty from other departments (academic or non-academic) and/or for non-university sources for the teaching of course sections reflected in the Credit Enrollment data for the given department. It was recognized that there may be a margin of error in the faculty to course

representation sought, but judgment in assembling credit enrollment data on the basis of the basic intent led to data which fell within the data exchange criterion of limited comparability.

In order to achieve the general intent of this study (i.e., the elimination of "material" departures from the "assumed" one-to-one relationship between I & DR faculty of a department and the courses/sections taught by that department) and thus reduce the margin of error in the faculty to course representation sought, certain adjustments of the reported data were needed. Figure 2 and subsequent expository show how this was done.

It should be noted that Figure 2 and subsequent explanation are not original to the author, but were borrowed from an AAU Institutions Data Exchange (AAUDE) organized in mid-1973. The AAUDE had no formal connection with the American Association of Universities (AAU) and, as such, no information or reports were prepared by the Data Exchange group per se. Permission to use this information was granted by one of the designated representatives of the AAUDE.

The left-hand square represents the I&DR--appointed ranked faculty and Teaching Assistant/Associates of Department A. The rectangles, in the center of the diagram, represent the courses of departments A and B and a set (discipline of courses) C, for which there is no single, budgeted, responsible department. The circle represents RF

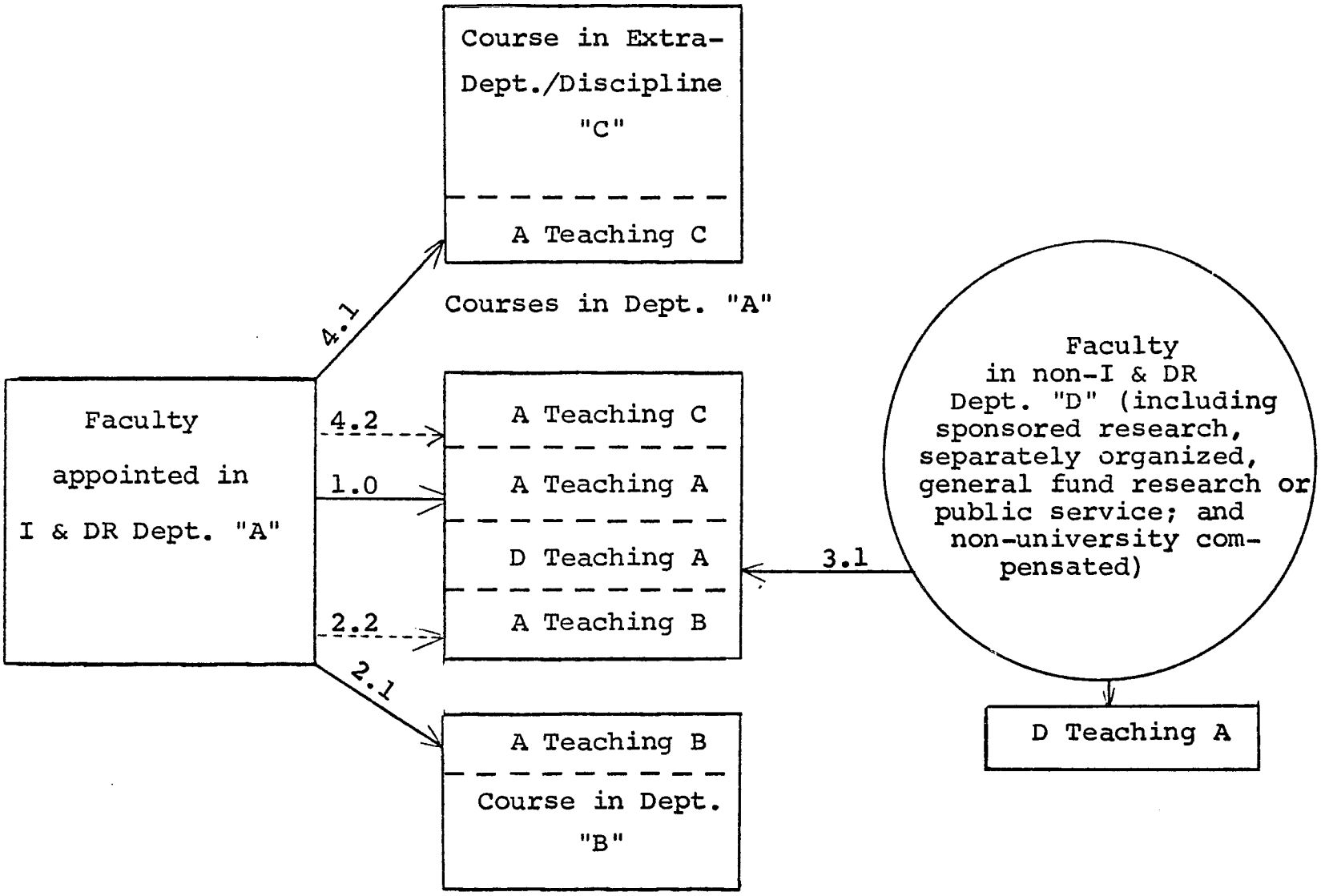

Figure 2. Adjustment of the Reported Data

and TA (or other personnel) FTE resources of a sponsored research or public service, separately organized general fund, research or public service administrative, or other non-I and DR fiscal account or budgetary unit, D (and non-university compensated FTE). The arrows define four faculty-teaching-course relationships to be considered.

It was recognized that many institutions may wish to establish a convention of their own as to the reporting of faculty data, for this reason, options that could have been used are also reported along with what was used in the study.

American Association of Universities
Data Exchange Procedures

1.0 Faculty Member of Department Teaches Course of Department. This is the normal, assumed, or "general intent" of credit enrollment data case and is covered by the assumption definitions.*

2.0 Faculty Member of One Department Teaches Course/Section of Another Department. Two reporting options are defined:

Option 2.1 - Include an allocated portion of FTE of faculty member of department A in faculty FTE aggregate of (Credit Enrollment form for) department B and exclude the allocated portion of FTE from Department A.*

Option 2.2 - Include the course/section data from the department B course taught by department A faculty member in (on Credit Enrollment form for) department A (and exclude this course/section data from department B aggregates.

3.0 Other than I & DR Account/Unit Individual

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*These were the options used throughout this study.

Teaches Course/Section of a Department. Two reporting options are defined:

Option 3.1 - Include an allocated portion of the individuals FTE in faculty FTE aggregate of (Credit Enrollment form for) department (A, in the diagram).*

Option 3.2 - Exclude the course/section data generated by the individual from the department's Credit Enrollment form.

4.0 Extra-Departmental Disciplines. Two reporting options are defined:

Option 4.1 - Include allocated portions of the FTEs of individuals teaching discipline C courses on a Credit Enrollment form for discipline C, thus creating and reporting a "pseudo-department," C. Exclude allocated portions of FTE from department A and department B aggregates.

Option 4.2 - Include course/section data of discipline C on Credit Enrollment form(s) of individual(s) teaching the individual courses/sections.*

Allocated Portions of FTE, as used in reporting options, above, could have been determined in one of several alternate manners. The basic alternatives are as follows:

Alternate #1, Teaching-Load-Based Allocation--For Cases 2 and 4, allocate in proportion to the SC, SH, or NS of the sections of the two or more departments taught by the individual. For Case 3, allocate on the basis of the individual's teaching load in the department (SC, SH, or NS) and the average teaching load of RF or TA of the department (e.g., SC/RF, SH/RF, or NS/RF). Using SC, the allocated proportion would be

$$\text{(Individual's FTE)} \times \frac{\text{SC of individual}}{\text{SC/RF of department}}$$

Alternate #2, Faculty Activity Analysis Allocation--Allocated portion of FTE is proportion of (full-time) effort devoted to "direct instruction," including

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*This was the option used through this study.

preparation, of the course(s)/section(s) as determined by self-report or other procedure.

Alternate #3, Use of budgeted FTE.*

The final adjustments to the data were made at the institution that sought comparability. Table 1 shows some of the adjustments used in this study and the deletions in data. The deletions were necessary because FTE was not available for the health professions (1200), military sciences (1800), and, in most cases law (1400); while interdisciplinary studies SCHs (4900) were usually the only reported data as the FTE was cross-charged to other departments, as were the area studies (0300).

Table 1

Adjustments and Deletions in Data

Combinations	to (HEGIS)
Forestry and Wildlife Mgt.	0114
Ag. Engr. and Mech.	0111
Physics, Astronomy and Phys. Sci.	1902
Ed. Psyc. and Psychology	2000
All Ed. (except 0835, 0808, 0839)	0801
Biology and Botany	0402
Geography and Anthropology	2206
Zoology and Biology	0407
Civil and Hydraulic Engr.	0908
Mech., Aero., and Ind. Engr.	0910
Speech and Drama	1506
Deletions	
All 0300's (Area Studies)	
All 1200's (Health Professions)	
All 1800's (Military Sciences)	
All 4900's (Interdisciplinary Studies)	
All 5000's (Two Year Programs)	

*This was the alternative used throughout this study.

The Statistical Design and Arrangement of Factors

The statistical model used in the analysis was a two-factor multivariate analysis of variance with fixed effects and using a factorial arrangement of treatments. Appropriate least squares adjustments were incorporated into the analysis as there were some missing observations within the cells. Figure 3 shows how the data were cast.

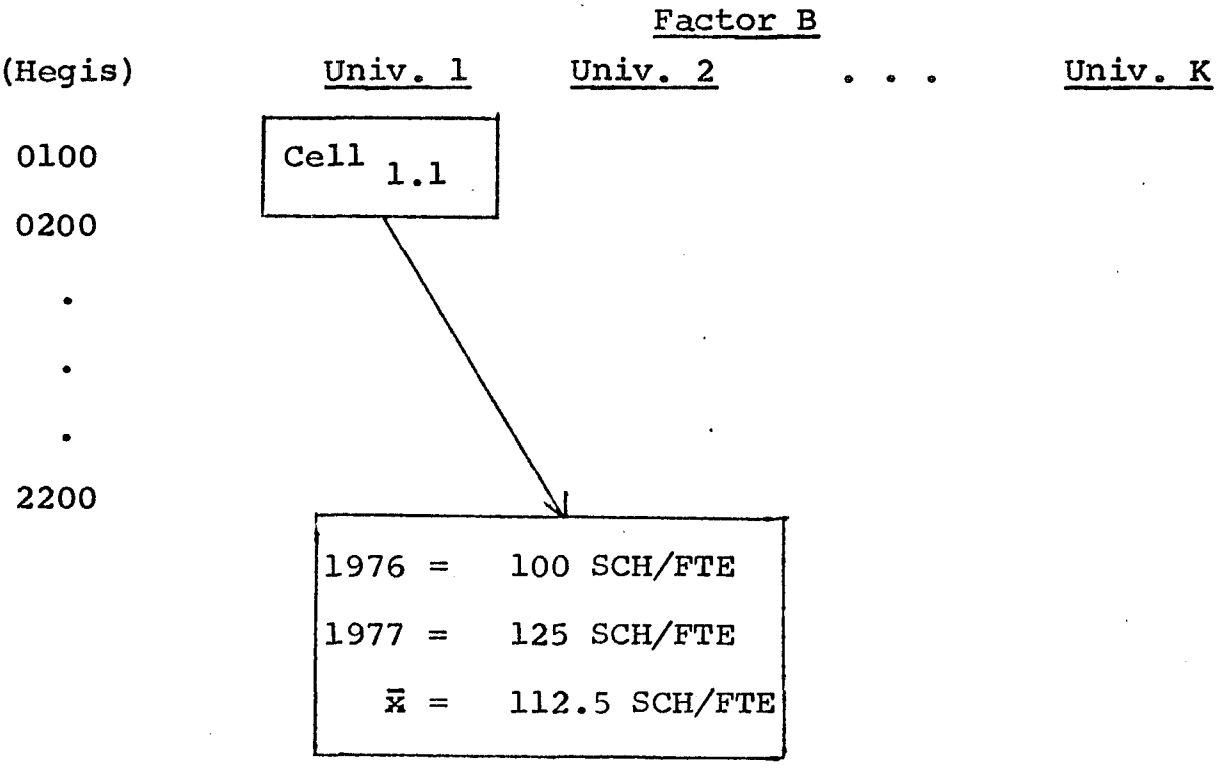

Figure 3. Schematic Representation of How Data Were Cast for the Analysis

Planned specific comparison tests were also included in the study in an attempt to isolate significant differences.

Chapter 4

PRESENTATION AND ANALYSIS OF DATA

In this chapter, data pertaining to faculty teaching load and subsequent analysis of the data are presented.

Reporting forms were prepared by cooperating institutions and distributed internally. These forms were used in preparation of the load sheets. Upon completion of the load sheets, they were forwarded to the host institution, in this case Louisiana State University.

Following receipt of the load sheets (see Appendix D) from the participating institutions, the data were coded onto code sheets for keypunching at the System Network Computer System at LSU. Printouts of the raw data were generated; checked against the load sheets for accuracy; annotated as to changes and omissions; and then forwarded to the individual institutions (see Appendix F) for corrections and updates.

During the first year of the study, eight universities cooperated in the exchange. The following year one of the original eight dropped out, however, eight new institutions were added yielding the fifteen universities cooperating in the data exchange's second year. For

reasons already stated, only five universities were used in this study, and because of the confidential nature of the data, they must remain anonymous.

The basic data used in the study and reported by the institutions in the study was in the form of student credit hours (SCHs) and full-time equivalent faculty (FTE). From these basic data, the dependent variable, student credit hours per full-time equivalent faculty member (SCH/FTE), was calculated. In this chapter, the basic data used in the study were first analyzed separately in an attempt to discern trends relative to the basic data among the institutions studied. A more detailed analysis of the SCH/FTE ratio follows.

Student credit hours were reported in terms of graduate and undergraduate student credit hours by HEGIS codes within each institution. Data in Table 2 show the percentage of graduate and undergraduate SCH's over the two year period. These percentages were obtained by summing over the graduate and undergraduate SCHs and the total SCHs over a two year period. These sums were taken for each school, averaged, and then the graduate and undergraduate means were divided by the mean total. All the percentages in Table 2 were rounded off to the nearest percent.

Table 2

Mean Percentages of Graduates and Undergraduate SCHs

Institution	Undergraduate Percent	Graduate Percent	Total Percent
One	90	10	100
Two	91	9	100
Three	90	10	100
Four	88	12	100
Five	88	12	100

Shown in Table 2 is the marked similarity in concentration of graduate and undergraduate SCHs among the various universities, however, when the mean percentages of the SCHs are analyzed by department as in Table 3, the pattern is a little less obvious. It should be cautioned that the percentage figures are indicative of concentration and not equalities. For example, one university may have 50 students taking Math 101 and generating 150 SCHs, while another university may have 100 students taking a similar Math 101 and generates over 300 SCHs; but, when the SCH production is taken as a percentage of the total, the two universities may be very alike in their overall SCH allocation.

Table 3

Mean Percentages of Total SCH Production by Institution and by Two Digit HEGIS Code

HEGIS	Discipline	INSTITUTION One	Two	Three	Four	Five
0100	Agriculture	3	5	9	6	0
0200	Arch/Env. Des.	2	3	3	2	2
0300	Area Studies	0	.02	0	0	.08
0400	Biol. Sciences	7	7	6	7	5
0500	Business	12	7	9	9	14
0600	Communications	.07	.07	.05	2	2
0700	Comp/Info. Sci.	.06	1	0	.09	1
0800	Education	11	7	9	5	6
0900	Engineering	5	5	14	4	6
1000	Fine/Applied Art	7	5	0	3	4
1100	Foreign Lang.	2	5	2	4	6
1300	Home Economics	2	2	0	3	2
1500	Letters	13	13	8	11	12
1600	Library Science	0	.08	0	.07	.06
1700	Mathematics	8	9	11	8	6
1900	Physical Sci.	9	9	12	9	10
2000	Psychology	3	4	3	5	5
2100	Public Affairs	.07	2	.06	2	.09
2200	Social Science	12	14	13	19	16
4900	Interdisciplinary Studies	.02	.01	0	.07	.08

Table 3 (continued)

HEGIS	Discipline	INSTITUTION One	Two	Three	Four	Five
TOTAL		96.22	98.18	99.11	99.23	97.31

In no instance do the percentages vary by as much as ten percent and in most instances, the percentages when compared to the other institutions vary only slightly. Among the five institutions studied, nearly 50 percent of their total SCH production is made up for in the following disciplines: Social Sciences (2200), Letters (1500), Education (0800), Business (0500), and Mathematics (1700). Correspondingly, the combined total of the following disciplines allow for less than 10 percent of the total SCH production: Interdisciplinary Studies (4900), Public Affairs (2100), Library Science (1600), Computer Science (0700), Communication (0600), and Area Studies (0300).

Table 4 shows the intercorrelations among the universities based on the raw means of the credit hour production over a two year period. The correlations compare the two digit HEGIS SCH production of the institutions as obtained using a Pearson Product Moment Correlation technique. In all cases the probability that the correlation was equal to zero was less than .001.

Table 4

Pearson Product Moment Correlation Coefficients of the SCH Production by Two Digit HEGIS

Institution	(1)	(2)	(3)	(4)	(5)
One (1)	1.00	.93	.66	.90	.89
Two (2)		1.00	.71	.93	.91
Three (3)			1.00	.63	.73
Four (4)				1.00	.94
Five (5)					1.00

Data in Table 4 indicate that all of the institutions share a functional relationship in the amount of SCH production by discipline. When the institutions were compared in their SCH production by discipline, they were all positively related; moreover, only when institutions were correlated with Institution Three did the coefficient of determination (i.e., r^2) drop below .8. This is quite meaningful as r^2 can be interpreted as the proportion of variance that is predictable from the variance of the other correlated variable and with an r^2 equal to .88, as when University Four was correlated with University Five, only twelve percent of the variance was unexplained. This is indicative of a direct association between the two universities with relatively little of their variance being left to chance.

The intercorrelation matrix of SCH production (Table 4) combined with the percentages found in Table 3 are strong evidence that the SCH production by discipline among the institutions studied was markedly similar. It is unknown why University Three differs so greatly in comparison to the other institutions.

As the full-time equivalent faculty was not broken down by graduate and undergraduate, similar comparison, as was done with SCHs, was not possible. FTE faculty was reported by two digit HEGIS and sub-categorized into the following: ranked (instructor and above), other (including graduate teaching assistants), and total for instruction; and ranked, other, and total for research. While all the institutions reported data for instruction, only a few reported data for research faculty; and so, because of the lack of available data, research faculty was not included in the study. Table 5 shows percentages of the total faculty that other faculty and ranked faculty accounted for in each institution.

Table 5

Percentages of the Total FTE Faculty Accounted for by Other and Ranked FTE

Institution	Ranked Faculty	Other Faculty	Total
One	73	27	100
Two	76	24	100

Table 5 (continued)

Institution	Ranked Faculty	Other Faculty	Total
Three	76	24	100
Four	85	15	100
Five	76	24	100

As with SCH production, there was a great similarity in the percentages of ranked and other faculty; moreover, with the exception of Institution Four, a three to one ratio existed for all institutions in regards to ranked versus other faculty. This similarity among the institutions is critical to the analysis of the SCH/FTE ratios for it infers a similarity in the use of teaching assistants. A comparison of teaching loads of ranked faculty in institutions not utilizing teaching assistants with institutions using teaching assistants would, in all likelihood, be less valid as it is common practice to use teaching assistants to teach large survey courses, thus freeing the ranked faculty to teach the smaller upper division and graduate courses.

Table 6 shows the ranked faculty as a percent of the total faculty based on two year averages. The ranked and other FTE faculty were separately summed over by two digit HEGIS and means obtained for each. These means were

then divided by the mean total faculty to obtain the percentages.

The subtotals in Table 6 of total ranked and other faculty differ from those in Table 5 because research personnel were not included in the totals and because faculty attributable to certain disciplines were not included for reasons already mentioned.

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UNIVERSITY MICROFILMS.

Table 6

Percents of Ranked and Other FTE Faculty Broken Down by Two Digit HEGIS Classification

HEGIS	Discipline	Inst 1		Inst 2		Inst 3		Inst 4		Inst 5	
		Ranked FTE	Other FTE	Ranked FTE	Other FTE	Ranked FTE	Other FTE	Ranked FTE	Other FTE	Ranked FTE	Other FTE
0100	Agriculture	2	.07	4	.04	7.6	2.5	16.3	2.4	0	0
0200	Architecture	2.5	.12	2.9	.02	4.2	.6	2	.04	1.7	.14
0300	Area Studies	0	0	.038	.01	0	0	0	0	.8	.2
0400	Life Sciences	4.2	.28	4	3	4.8	2.6	7.26	1.2	4.7	1.2
0500	Business	7.46	3.46	4	2	5.7	1.9	4.3	.66	5.9	2.1
0600	Communications	.688	.09	.07	.02	.6	.15	.66	.17	1.5	.38
0700	Computer Science	.45	.12	.07	.02	0	0	.92	.17	.98	.24
0800	Education	12.00	.348	6	.09	6.86	2	7.1	.4	6.4	1.5
0900	Engineering	7.96	1.16	7	2	14	1.3	2.2	1.4	8.2	1.3
1000	Fine Arts	8.29	1.23	5	2	0	0	2.1	.57	5.8	1.2
1100	Foreign Languages	2.37	1.4	3	1	1.7	.15	2.7	.92	5.3	3
1300	Home Economics	1.87	.06	2	.008	0	0	2.7	.3	1.8	.14
1500	Letters	5.1	9.8	9	4	5.3	1.8	5.3	1.5	8.9	4.1
1600	Library Science	0	0	.8	.1	0	0	.9	.04	.7	.04
1700	Mathematics	2.75	2.2	5	.01	3.95	2.6	5.2	1.3	3.05	1.9
1900	Physical Sciences	5.6	1.18	7	6	10.3	5.8	4.8	1.36	6.4	2.9
2000	Psychology	2.47	.34	2	.05	1.8	.6	2.5	.39	2.9	.72
2100	Public Affairs	.83	0	3	.04	.7	.33	1.9	.09	1.79	.02
2200	Social Studies	8.46	1.6	6	3	7.27	1.8	9.6	2	8.77	2.79
Sub Totals		74.99	23.46	70.86	23.4	74.78	24.18	78.44	14.91	75.6	23.8
Grand Totals		98.426		94.28		98.91		93.35		99.4	

Whereas in Table 3 it was found that 50 percent of the SCH production was made up of the following disciplines: Social Sciences (2200), Letters (1500), Education (0800), Business (0500), and Mathematics (1700) the same can not be said of the total faculty by discipline where the combined totals of the aforementioned disciplines ranged from 53.18 percent in Institution One to a low of 35.56 percent in Institution Five. In analyzing Table 6 a definite pattern emerges in the use of ranked and other faculty by discipline among the institutions studied, however, the strength of relationship is not nearly as strong as in the SCH production. As further proof of this, Table 7 summarizes the intercorrelations among the institutions based on ranked faculty only. These correlations were based on the raw means of the two digit HEGIS classifications per ranked faculty. Arithmetic means were calculated for each discipline by institution and these means served as the element in calculating the correlation coefficients among the institutions.

Table 7

Pearson Product Moment Correlation Coefficients of FTE Ranked Faculty by Two Digit HEGIS

Institution	(1)	(2)	(3)	(4)	(5)
One	1.00	.74	.82	.30	.78

Table 7 (continued)

Institution	(1)	(2)	(3)	(4)	(5)
Two		1.00	.64	.41	.92
Three			1.00	.38	.35
Four				1.00	.79
Five					1.00

The intercorrelations from Table 7 show that Institutions Two and Five are highly related in regards to their ranked faculty as are Institutions One and Five, One and Three, One and Two, and Four and Five. The lowest correlations occurred when institutions were compared to Institution Four except when Institution Four was correlated with Five. In general, the allocation of ranked FTE faculty by discipline among the institutions was similar but not to the extent that SCH production was similarly distributed. Greater differences were found in comparing ranked FTE faculty across institutions than were found in comparing SCH production across institutions. This would indicate that the SCH/RFTE ratio when compared across institutions would be more a function of ranked FTE faculty than of SCH production. Differences in the SCH/RFTE ratio when compared across institutions were more attributable to the denominator, ranked FTE faculty,

because this variable varied more from institution to institution than did the SCH production.

The dependent variable used in the analysis of variance was student credit hours per full-time equivalent faculty (SCH/FTE). The SCH/FTE ratio was found by adding the SCHs for each two-digit HEGIS discipline and correspondingly, adding the FTE associated with that particular two-digit HEGIS discipline. A ratio was then determined by dividing the SCH sum by the FTE sum giving a SCH/FTE ratio. This process was used in determining the SCH/FTE ratio for ranked, other and total faculty. Arithmetic means for SCH/FTE production for ranked faculty and total faculty are shown in Table 8.

Table 8

Arithmetic Means for SCH/FTE Production for Ranked Faculty and Total Faculty SCH/FTE

HEGIS	Discipline	School	SCH/RFTE	SCH/TFTE
100	Agriculture	1	422.0	408.5
100	Agriculture	2	328.5	301.0
100	Agriculture	3	305.0	227.5
100	Agriculture	4	77.5	69.5
100	Agriculture	5	0	0
200	Architecture	1	247.5	236.0
200	Architecture	2	296.0	272.0

Table 8 (continued)

HEGIS	Discipline	School	SCH/RFTE	SCH/TFTE
200	Architecture	3	205.5	179.5
200	Architecture	4	228.0	223.5
200	Architecture	5	238.5	221.5
400	Biol. Sciences	1	447.5	419.5
400	Biol. Sciences	2	406.0	233.0
400	Biol. Sciences	3	283.0	186.5
400	Biol. Sciences	4	229.0	177.6
400	Biol. Sciences	5	306.0	294.0
500	Business	1	428.5	294.0
500	Business	2	419.0	324.0
500	Business	3	424.5	319.0
500	Business	4	435.5	386.5
500	Business	5	500.5	383.0
600	Communications	1	281.5	249.0
600	Communications	2	259.5	212.5
600	Communications	3	231.0	187.0
600	Communications	4	227.0	200.5
600	Communications	5	264.5	211.5
700	Comp./Info. Sci	1	286.5	208.5
700	Comp./Info. Sci	2	379.5	301.5
700	Comp./Info. Sci	3	0.0	0.0
700	Comp./Info. Sci	4	185.5	159.5
700	Comp./Info. Sci	5	255.5	204.0

Table 8 (continued)

HEGIS	Discipline	School	SCH/RFTE	SCH/TFTE
800	Education	1	234.5	227.5
800	Education	2	260.5	226.5
800	Education	3	327.0	251.5
800	Education	4	151.0	141.0
800	Education	5	237.5	192.0
900	Engineering	1	165.0	144.0
900	Engineering	2	167.0	134.5
900	Engineering	3	254.5	233.0
900	Engineering	4	111.0	97.0
900	Engineering	5	186.5	160.5
1000	Fine/Applied Art	1	221.5	187.5
1000	Fine/Applied Art	2	209.0	162.5
1000	Fine/Applied Art	3	0.0	0.0
1000	Fine/Applied Art	4	153.5	137.5
1000	Fine/Applied Art	5	171.5	136.0
1100	Foreign Language	1	349.0	215.0
1100	Foreign Language	2	368.0	242.0
1100	Foreign Language	3	256.5	236.0
1100	Foreign Language	4	318.0	256.5
1100	Foreign Language	5	269.5	170.5
1300	Home Economics	1	226.0	219.0
1300	Home Economics	2	298.0	283.0
1300	Home Economics	3	0.0	0.0

Table 8 (continued)

HEGIS	Discipline	School	SCH/RFTE	SCH/TFTE
1300	Home Economics	4	213.5	191.0
1300	Home Economics	5	265.0	244.0
1500	Letters	1	693.0	231.0
1500	Letters	2	363.5	250.0
1500	Letters	3	404.5	305.5
1500	Letters	4	438.5	366.5
1500	Letters	5	330.0	226.5
1600	Library Science	1	0.0	0.0
1600	Library Science	2	235.0	209.5
1600	Library Science	3	0.0	0.0
1600	Library Science	4	182.5	175.0
1600	Library Science	5	192.5	182.0
1700	Mathematics	1	748.5	413.0
1700	Mathematics	2	437.0	342.0
1700	Mathematics	3	695.0	419.5
1700	Mathematics	4	341.5	277.5
1700	Mathematics	5	479.5	297.5
1900	Physical Sci.	1	406.0	333.5
1900	Physical Sci.	2	333.5	182.0
1900	Physical Sci.	3	335.0	214.5
1900	Physical Sci.	4	409.5	333.5
1900	Physical Sci.	5	373.5	257.0
2000	Psychology	1	373.5	329.5

Table 8 (continued)

HEGIS	Discipline	School	SCH/RFTE	SCH/TFTE
2000	Psychology	2	606.5	461.0
2000	Psychology	3	434.5	335.0
2000	Psychology	4	416.0	344.5
2000	Psychology	5	420.5	335.0
2100	Public Affairs	1	257.0	257.0
2100	Public Affairs	2	177.5	153.5
2100	Public Affairs	3	245.0	206.0
2100	Public Affairs	4	186.5	170.5
2100	Public Affairs	5	125.5	123.5
2200	Social Science	1	380.0	318.0
2200	Social Science	2	563.5	382.5
2200	Social Science	3	454.0	365.5
2200	Social Science	4	478.5	382.0
2200	Social Science	5	431.5	327.0

Table 9 shows the overall means for each school of SCH/ranked FTE and SCH/total FTE. These means were calculated by summing over all the two-digit HEGIS disciplines' SCHs and FTE over a two year period. Table 9 shows that Universities One and Two are very similar in both their SCH/RFTE production and SCH/TFTE production total means; and that, Universities Three, Four and Five while different from Universities One and Two, are in

amongst themselves very similar in their overall SCH/FTE production ratios. At this time it is not known why Institutions One and Two are so similiar in their overall mean SCH/FTE production ratios or why their production ratios are so much greater than the other three institutions, however, both Universities One and Two are flagship campuses of large university systems.

Table 9

Overall Means for the SCH/RFTE and SCH/TFTE Production

School	SCH/RFTE	SCH/TFTE
1	362.79	275.91
2	339.31	259.61
3	346.79	261.86
4	265.69	227.69
5	297.06	229.59

Table 10 shows the arithmetic means for the SCH/RFTE production of all the schools combined for each two digit HEGIS classification. Also included in Table 10 are the corresponding standard deviations, standard errors and range associated with each two digit HEGIS classification. The smallest SCH/RFTE mean was associated with Library Science (1600) and this may be due to the small SCH production of that division and not to large number of faculty.

Table 10

Table of Arithmetic Means, Standard Deviations, Standard Errors of the Means, and Minimum and Maximum Values for the Variable SCH/RFTE by Division

HEGIS	Discipline	Mean	Standard Deviation	Standard Error	Minimum	Maximum
0100	Agriculture	283.25	146.12	51.66	77	422
0200	Architecture	243.1	33.38	10.556	205	296
0400	Life Sciences	334.3	95.21	30.109	229	447
0500	Business	441.6	41.10	12.998	419	500
0600	Communications	252.7	39.59	12.518	227	281
0700	Computer Science	276.75	80.48	28.45	186	380
0800	Education	242.1	59.76	18.898	151	527
0900	Engineering	176.8	49.02	15.502	111	254
1000	Fine Arts	188.88	31.74	11.22	154	221
1100	Foreign Languages	312.2	72.092	22.798	256	368
1300	Home Economics	250.63	38.45	13.59	213	298

Table 10 (continued)

HEGIS	Discipline	Mean	Standard Deviation	Standard Error	Minimum	Maximum
1500	Letters	445.9	142.729	45.13	330	693
1600	Library Science	203.33	27.88	11.38	182	235
1700	Mathematics	540.3	174.009	77.82	192	748
1900	Physical Sciences	371.9	45.698	14.45	333	409
2000	Psychology	450.2	97.526	30.84	375	606
2100	Public Affairs	198.3	54.573	17.26	125	257
2200	Social Studies	461.5	69.149	21.87	380	563

Figures 4-8 are histograms of the mean SCH/RFTE production and were generated from the data found in Table 8.

Figure 4 shows the unequal distribution of SCH/RFTE within University One. The mean SCH/RFTE for University One was 342 with a standard deviation of 178. The only two disciplines that fall outside of one standard deviation from the mean are the 1500s (Letters) and 1700s (Mathematics); also, the aforementioned two disciplines represented the highest production ratios for University One. The lowest SCH/RFTE ratio was found in the 0900s (Engineering).

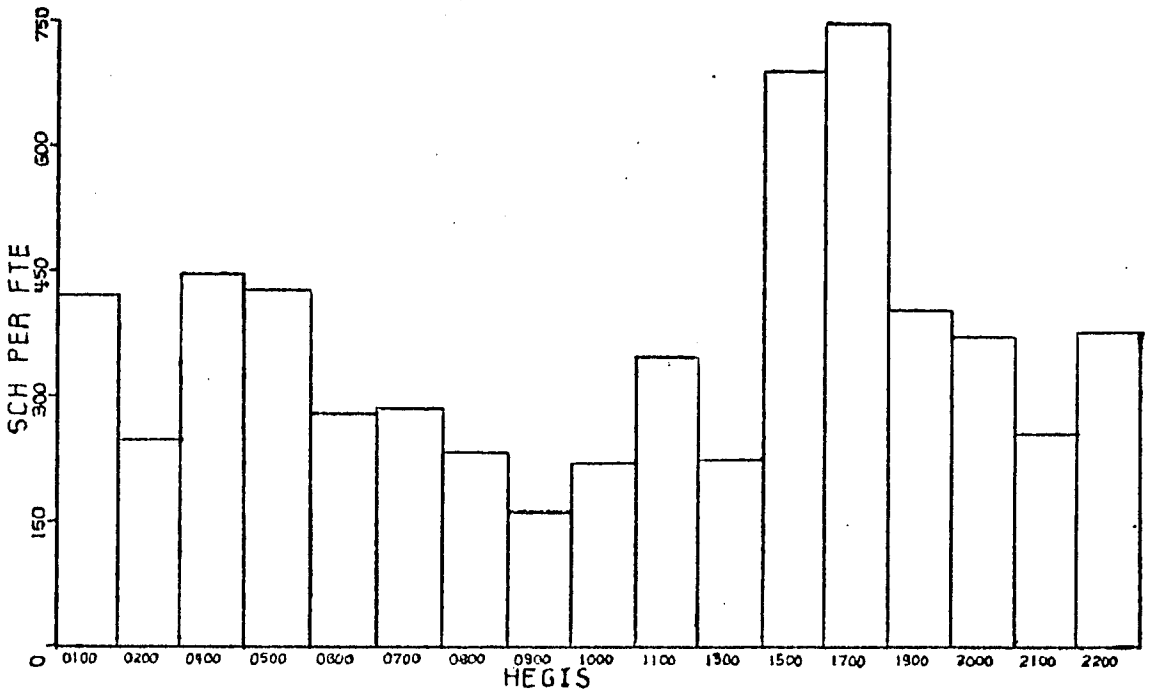

Figure 4. Mean SCH/FTE Production of Ranked Faculty at University One

The mean SCH/RFTE for University Two in Figure 5 was 339.31 with a standard deviation of 120.10. It should be noted that the increments on the ordinate are 100 each for Figures 5-8, only Figure 4 is different with increments of 150. The largest ratio for SCH/FTE ranked production was found in the 2200s (Social Sciences) while the smallest was found in the 0900s (Engineering) and the 2100s (Public Affairs).

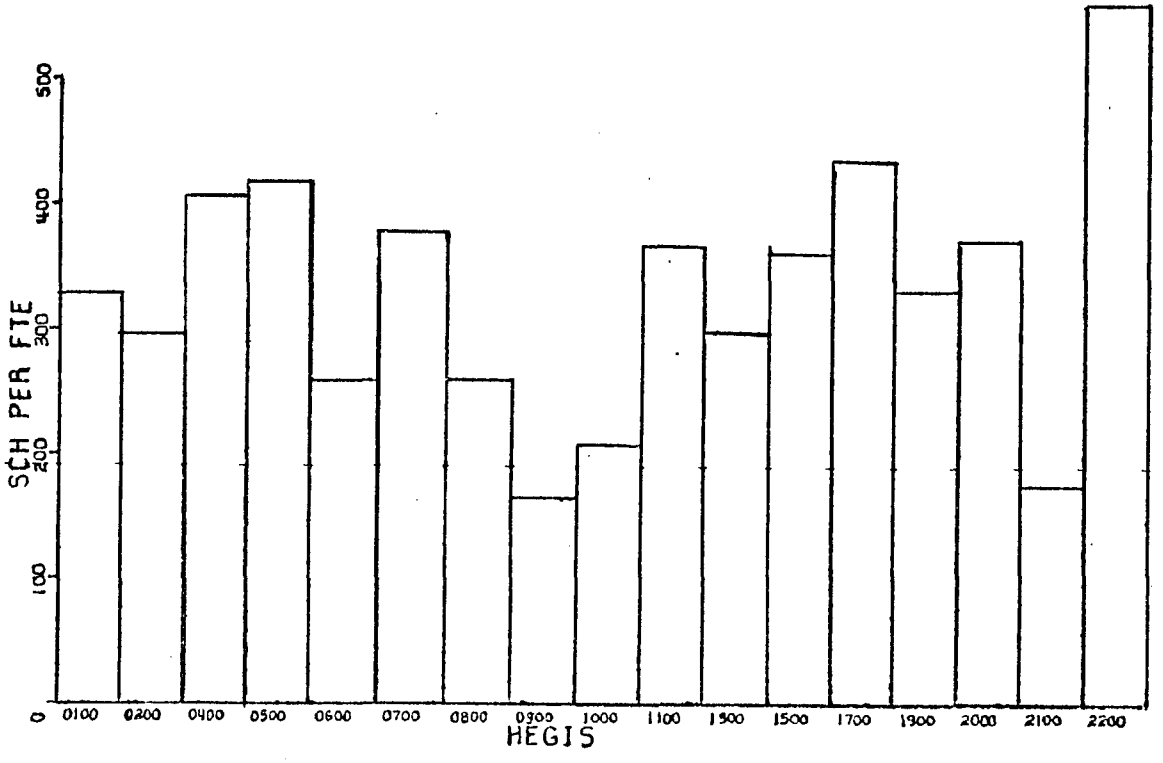

Figure 5. Mean SCH/FTE Production of Ranked Faculty at University Two

University Three, as shown in Figure 6 had the most missing values for the divisions in all the institutions studied, with missing values found in the following: 0700 (Computer Science), 1000 (Fine Arts), 1300 (Home Economics), and 1600 (Library Science). The mean for the SCH/RFTE production was 269 and the standard deviation was 186 (which was the largest of the institutions studied). The highest SCH/RFTE ratio was found in 1700s (Mathematics) and the lowest in 0200s (Architecture) followed closely by 1100s (Foreign Languages), 2100s (Public Affairs), 0900s (Engineering) and the 0600s (Communications).

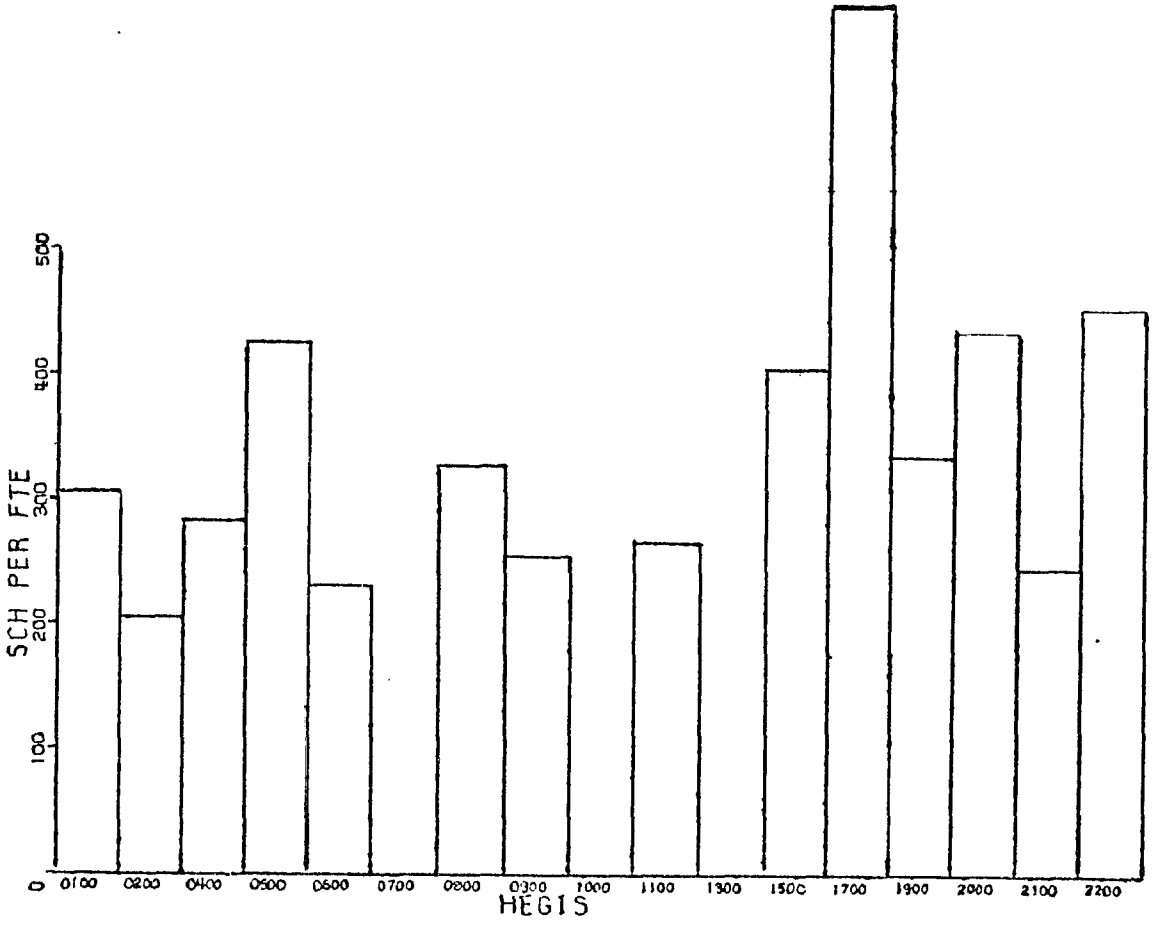

Figure 6. Mean SCH/FTE Production of Ranked Faculty at University Three

Figure 7 shows the SCH/RFTE production for University Four. University Four had the lowest mean SCH/RFTE ratio at 266 and the next to lowest standard deviation at 125. The highest SCH/RFTE ratios were found in the 2200s (Social Sciences), 1500s (Letters), and 0500s (Business). The lowest ratios were found in 0100s (Agriculture), 0900s (Engineering), and 2100s (Public Affairs). Universities Four and Five (Figure 8) were the only two universities which had no SCH/RFTE ratio above a hundred in the 0100s (Agriculture) and, in fact, University Four had no SCH/RFTE ratio above 500.

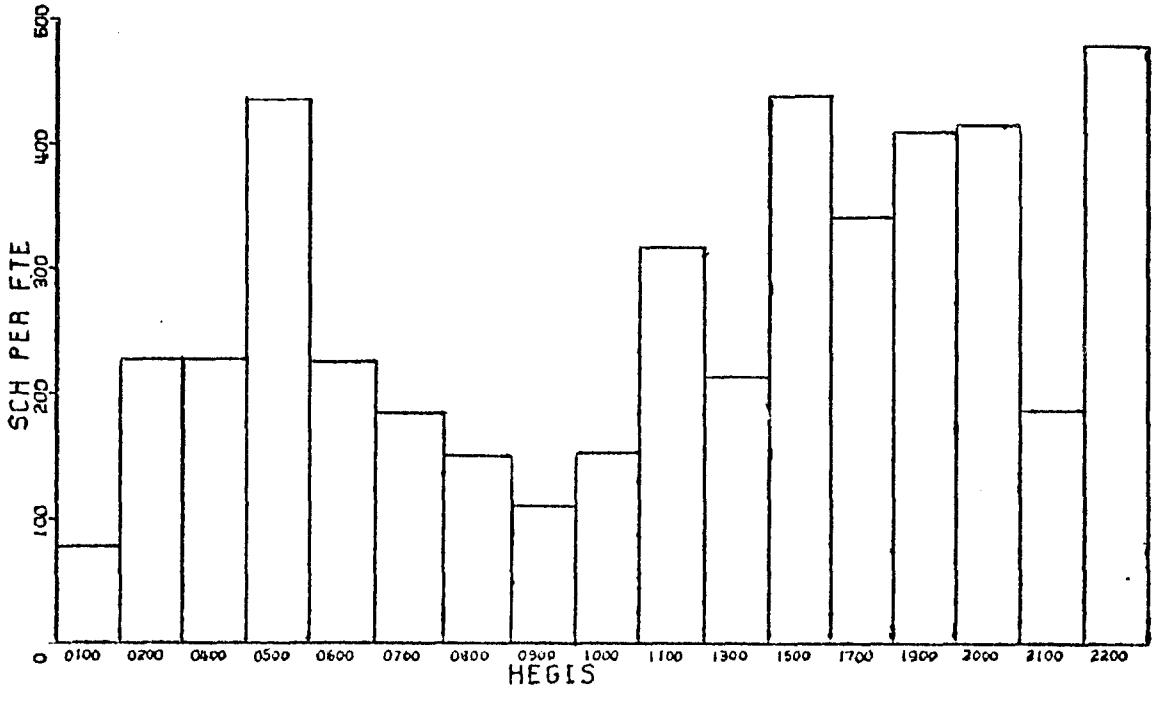

Figure 7. Mean SCH/FTE Production of Ranked Faculty at University Four

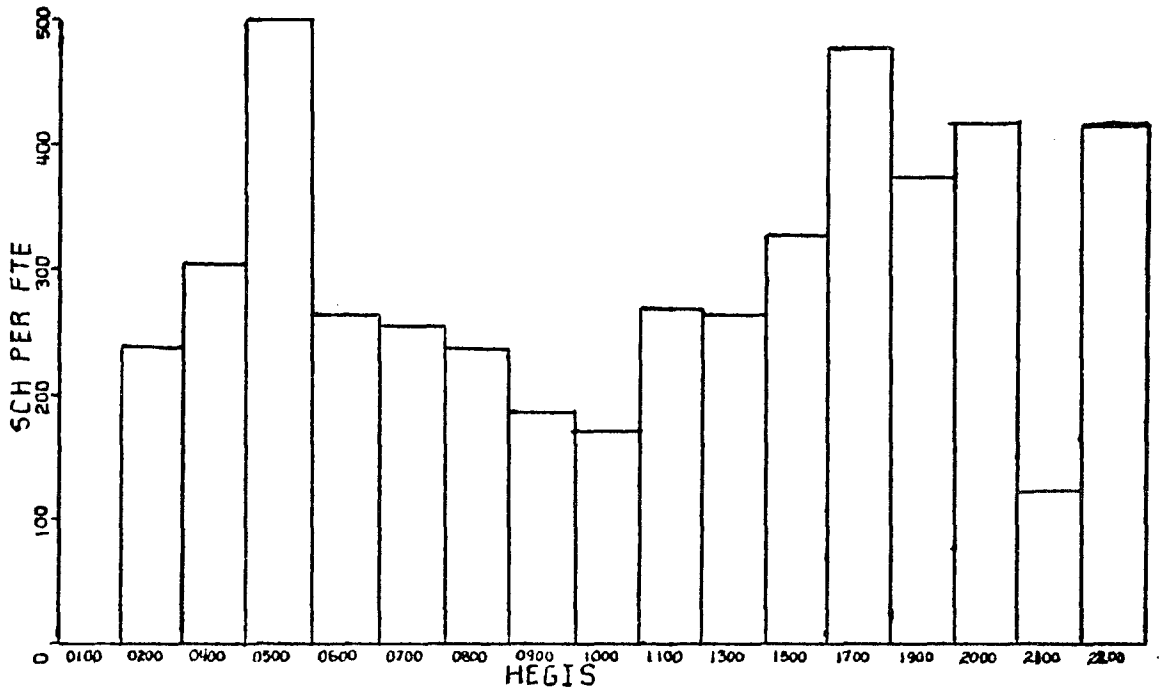

Figure 8. Mean SCH/FTE Production of Ranked Faculty at University Five

University Five, which had the largest enrollment of any of the institutions studied, ranked in the middle of the other institutions with a mean of 280 and a standard deviation of 127. Two of the other institutions had higher means and standard deviations than did University Five and the remaining other two had lower means and standard deviations for the SCH/RFTE ratio.

Figure 9 is an overlay of all the institutions in their SCH/RFTE ratios. The connected line in Figure 9 is emblematic of the mean; whereas, the different symbols represent the individual institutions. As can be seen in Figure 9, unless no data was reported--hence a zero was recorded, no SCH/RFTE was below 50 and only one was less than 100. The great majority of ratios fell between 150 and 450 for all the divisions within the universities. Only the 1700s (Mathematics) and 1500s (Letters) had SCH/RFTE ratios above 650 and the 2000s (Psychology) was the only other HEGIS classification above 600.

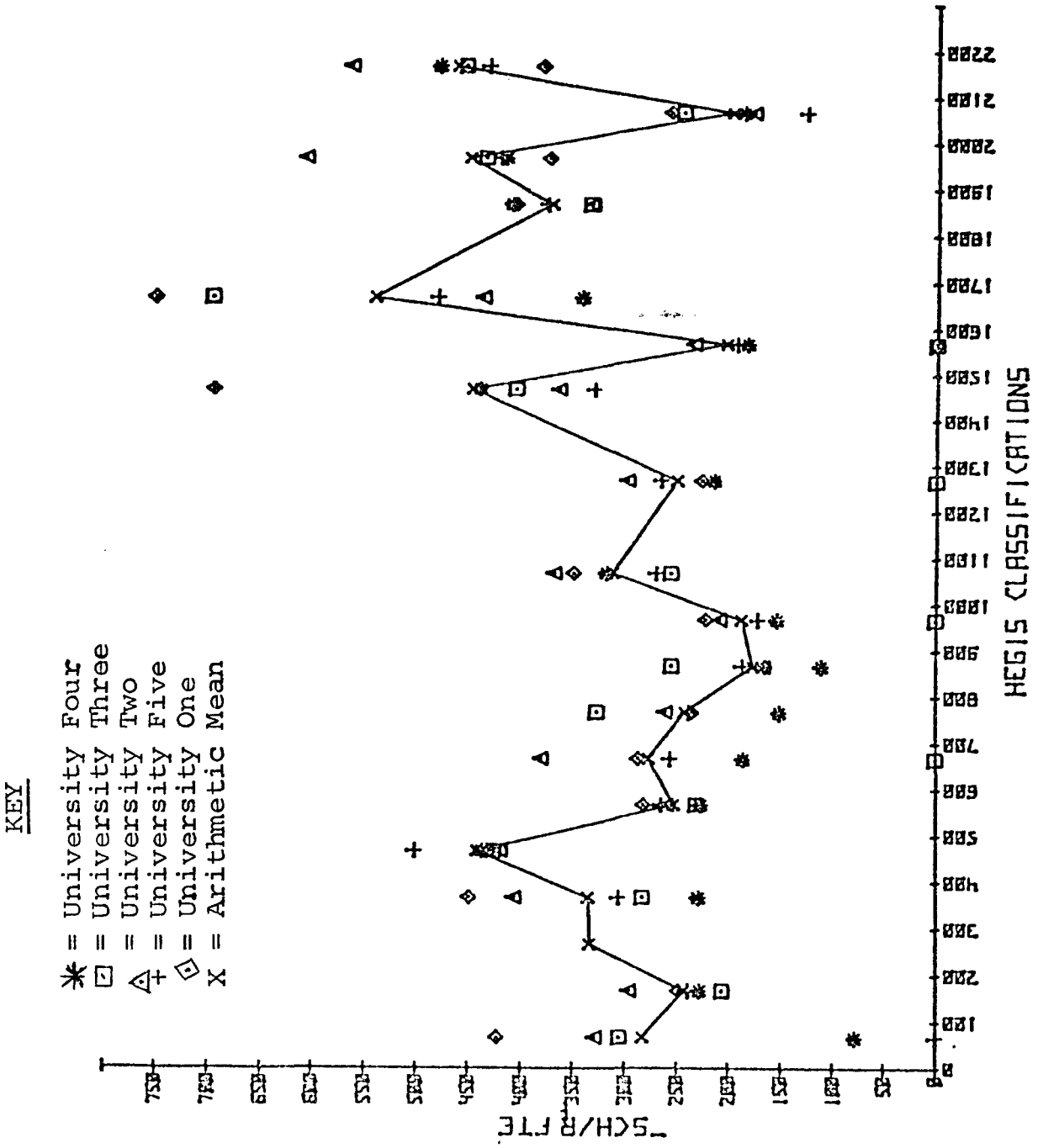

Figure 9. Scattergram of SCH/RFTE Productions of the Universities by Two Digit HEGIS Classification

In Table 11 the analysis of variance computations are presented for the dependent variable, student credit hour production per ranked faculty full-time equivalent (SCH/RFTE). Mathematically, the univariate model used was:

$$Y_{ijk} = U + A_i + B_j + (AB)_{ij} + C_k + E_{ijk}$$

where;

Y_{ijk} = value of an observation for the dependent variable (in this case SCH/RFTE from the Kth year, Jth division, Ith institution)

U = a constant

A_i = the effect due to factor A (institution)

B_j = the effect due to factor B (divisions within an institution

$(AB)_{ij}$ = the effect due to the interaction of factors A_i and B_j (Division by Institution)

C_k = the block effect (year)

E_{ijk} = residual error assumed to be normally and independently distributed with a mean of zero and a common variance.

For the purpose of this study, all effects were considered to be fixed; therefore, extrapolation outside of the institutions studied could not be considered. The above model was used throughout the study except in the case when the dependent variable changed from SCH/RFTE to SCH/TFTE or when the dependent variable was two dimensional, in any case, the right hand side of the equation remained the same.

Table 11

Analysis of Variance for Dependent Variable SCH/RFTE Production

Source	Degrees of Freedom	Sum of Squares	F	PR<F
Institution	4	182532.85	22.66	.0001
Division	17	1961747.27	57.29	.0001
Division x Institution	62	704117.96	5.64	.0001
Year	1	9655.16	4.79	.0314
Error	83	167179.34	-	-
Total	167	-	-	-

Data in Table 11, indicate that highly significant differences ($p < .01$) occur among the institutions when the dependent variable SCH/RFTE is considered. The overall SCH/RFTE mean was 320.98 with a standard deviation of 44.88. With a coefficient of determination equal to .95, most of the variance in SCH/RFTE ratio was accounted for by the model.

From Table 11 it can be seen that the Institutions differ in their overall mean SCH/RFTE ratio means. Table 12 shows the arithmetic means for the variables SCH/RFTE and SCH/TFTE by Institution.

Table 12

Arithmetic Means for SCH/RFTE and for SCH/TFTE Production by the Institutions

School	N	SCH/RFTE	SCH/TFTE
1	34	362.79	275.91
2	36	339.30	259.61
3	28	346.78	261.85
4	36	265.69	227.69
5	34	297.05	229.58

Significant differences were also found in the main effect of divisions ($p < .01$), indicative of different teaching load means among the various two digit HEGIS division classifications. It was felt at the outset of the study that differences would be found here because of the twofold differences in student concentration (SCHs) and ranked faculty (RFTE) among the various divisions within the insitutions. As an example, it was suspected that because of the large survey courses in both Mathematics and in English that the average teaching loads would be greater because the entire student body must take these courses, however, in disciplines such as Architecture or Engineering which also offer survey courses, these courses are not required of the entire student body in order to

graduate as in the case of Freshman English. Table 13 shows both the SCH/RFTE means and the SCH/TFTE means used in the calculation of the main effect of division.

Table 13

Arithmetic Means of SCH/RFTE and SCH/TFTE by Institution and by Division

HEGIS	Discipline	SCH/RFTE	SCH/TFTE
0100	Agriculture	283.25	251.62
0200	Architecture	243.10	226.50
0400	Life Sciences	334.30	249.60
0500	Business	441.60	341.30
0600	Communications	252.70	212.10
0700	Computer Science	276.75	218.37
0800	Education	242.10	207.70
0900	Engineering	176.80	153.80
1000	Fine Arts	188.87	155.87
1100	Foreign Languages	312.20	224.00
1300	Home Economics	250.62	234.25
1500	Letters	445.90	275.90
1600	Library Science	203.33	188.83
1700	Mathematics	540.30	349.90
1900	Physical Sciences	371.90	264.10
2000	Psychology	450.20	381.00
2100	Public Affairs	198.30	183.90
2200	Social Studies	461.50	355.00

Not only do the various institutions vary significantly when the SCH/RFTE means are compared overall, they also vary when compared across institutions by divisions ($p < .01$). This interaction indicates that ranked faculty differ in mean teaching loads within their divisions' counterparts at other institutions. For example, faculty teaching Agriculture courses at one institution, differ as to teaching load from other faculty teaching Agriculture at other institutions. Table 8 summarizes the various mean teaching loads for testing the interaction of ranked faculty teaching load by divisions across the institutions.

In analyzing the dependent variable SCH/RFTE results were further obfuscated by the significance of the year effect ($p < .03$), which indicates instability of faculty teaching loads over time. Table 14 shows the means of both SCH/RFTE and SCH/TFTE over the institutions by year.

Table 14

Arithmetic Means of Both SCH/RFTE and SCH/TFTE over Institutions by Years

Year	N	SCH/RFTE	SCH/TFTE
1975	84	314.68	236.16
1976	84	299.71	240.17

The analysis of variance results found in Table 11 for the dependent variable SCH/RFTE indicate that faculty teaching load means differ from institution to institution in an overall manner ($p < .01$); from division to division ($p < .01$); from institutional division to institutional division ($p < .01$); and from year to year ($p < .03$).

As has been previously mentioned the variable SCH/TFTE was not of primary importance to this study, except, for its use in the multivariate analysis, however, Table 15 summarizes the univariate analysis of variance results for the dependent variable SCH/TFTE.

Table 15

Analysis of Variance for Dependent Variable SCH/TFTE Production

Source	Degree of Freedom	Sum of Squares	F	PR < F
Institution	4	51922.71	7.24	.0001
Division	17	708541.94	22.89	.0001
Division x Institution	66	458442.39	3.66	.0001
Year	1	404.10	.23	.6363
Error	83	148889.90	-	-
Total	167	-	-	-

As was the case with the dependent variable SCH/RFTE, highly significant differences ($p < .01$) were

found in the main effects of Institution and Division, as well as, in the simple effects of Division by Institution; however, when the block effect of year was considered, no significant differences were indicated ($p < .6363$). This would indicate that while ranked faculty may vary in their teaching loads from year to year, the use of other FTE faculty may stabilize these differences when comparing mean teaching loads from year to year (see Table 14).

Table 16 shows the results when the SCH/FTE total and SCH/FTE ranked are treated as two dimensional. Instead of relying on a series of univariate tests only, multivariate analysis was incorporated into the study for the following reasons: One, correlations between the dependent variables are usually something other than zero. For example, high teaching loads among ranked faculty in one division will probably mean high teaching loads for the total FTE in that division and under this condition of correlated dependent variables, application of univariate tests--one for each dependent variable--causes the probability of a Type I error to be higher than the level of significance that is used.

The second reason for avoiding a series of strictly univariate tests was the fact that as the number of dependent variables increases, the probability of finding a significant difference by chance alone also increases, even if by chance, all correlations among the dependent variables are equal to zero (Winer, 1971). Table 16 shows

the results for the testing of the null hypothesis of no significant differences using a multivariate analysis of variance technique employing the two dependent measures of SCH/RFTE and SCH/TFTE as the criteria with the independent variables being institution, division, and the division by institution interaction.

Table 16

Multivariate Analysis of Variance
With the Two Dimensional
Criterion Variable of
SCH/RFTE and SCH/TFTE

Source of Variation	df	F[1]
Institution	8/166	8.61**
Division	34/166	12.39**
Division x Institution	136/166	4.65**
Year	2/82	6.61**

**P < .01

[1]Pillai's Trace used in F approximations

The results found in Table 16 confirm the univariate ANOVA's generated for SCH/RFTE. The main effects of Institution and Division were each highly significant at the .0001 alpha level, as was the multivariate interaction and the year effect.

Unlike many classical statistical studies, where rejection of the null hypothesis in favor of the alternative hypothesis are sought, this was not the case in this study. It was hypothesized that few differences would be found among the institutions studied, as this would develop a case for comparability and possible norming procedures for faculty teaching loads across the divisions by institutions.

Based on this premise, orthogonal comparisons were planned, in the hope that significant differences could be isolated among the various divisions.

The orthogonal contrasts were performed on the division by institution interaction. Table 17 shows the table of multipliers used in the analysis. These comparisons were repeated for each degree of freedom associated with the interaction and the main effect of instruction and with a single comparison associated with each degree of freedom; hence, the interaction effect was subdivided into an additive sums of squares associated with each comparison.

Table 17

Orthogonal Multipliers and Comparisons Made

Comparison	Inst. 1	Inst. 2	Inst. 3	Inst. 4	Inst. 5
1,2 vs 3,4,5	1.5	1.5	-1	-1	-1

Table 17 (continued)

Comparison	Inst. 1	Inst. 2	Inst. 3	Inst. 4	Inst. 5
1 vs 2	1	-1	0	0	0
3 vs 4,5	0	0	2	-1	-1
4 vs 5	0	0	0	+1	-1

Note that the sum of the multipliers for each comparison is equal to zero and the sum of the cross products is also equal to zero and thus, the comparisons are orthogonal.

The comparisons were used in an attempt to find out if a particular pattern or trend of faculty teaching load could be isolated among selected institutions. The first comparison compared the flagship campuses of two large university systems which competed with an almost identical amount of public and private colleges and universities within their respective states for students, with three other institutions that varied greatly with the number of other institutions that they had to compete with for students in their respective states. Institutions One and Two were located in states which had average faculty salaries among the lowest of all states (NCHEMS, 1977) and both of these universities had the lowest student/faculty ratios in both the 1974-75 and 1972-73 school years.

The second comparison followed naturally as it compared Institutions One and Two. Given similarities in faculty salaries, and competitiveness with surrounding institutions, teaching loads among these universities when compared across divisions should not be significantly different.

The third comparison hypothesized no significant differences when Institution Three was compared with Institutions Four and Five. Albeit, none of the institutions contained within this study had programs that were singled out as being in the top twenty by the Carnegie Commission on Higher Education (Mayhew, 1973), Institution Three is better known to the academic community for its technical programs in Agriculture and Engineering, whereas, Institutions Four and Five (and also One and Two) would be considered more eclectic in scope and mission.

Whereas, the fourth comparison was set (i.e., no other comparison could have been made and still maintained orthogonality), it compared two institutions sharing the highest average faculty salaries.

Table 18 summarizes the multivariate and univariate results for the orthogonal comparisons. The four comparisons listed in Table 17 were repeated for each divisional level making a total of seventy-two possible comparisons, however, due to missing cells, only sixty-six comparisons were made.

Table 18

Summary of Multivariate and Univariate
Orthogonal Comparison's Probabilities
Associated with Analysis of Variance

	Source	Multivariate	Univariate SCH/RFTE	Univariate SCH/TFTE
Comparison 1[1]	100's (Agriculture)	.0001**	.0001**	.0001**
2		.0437*	.0403*	.0130*
3		.0001**	.0001**	.0002**
Comparison 1	200's (Architecture)	.2212	.1988	.0815
2		.5607	.2830	.3978
3		.7127	.4236	.4743
4		.8916	.9940	.7784
Comparison 1	400's (Life Sciences)	.0001**	.0001**	.0001**
2		.0001**	.3578	.0001**
3		.6620	.3698	.5951
4		.2476	.1482	.1032

Table 18 (continued)

	Source	Multivariate	Univariate SCH/RFTE	Univariate SCH/TFTE
Comparison 1		.2513	.6006	.1389
2	500's (Business)	.4650	.8329	.9807
3		.3958	.5854	.2062
4		.3511	.2400	.8065
Comparison 1		.3714	.3123	.1580
2	600's (Communications)	.6828	.6253	.3913
3		.9544	.8317	.9985
4		.8254	.5832	.5506
Comparison 1[2]		.0095**	.0001**	.0004**
2	700's (Computer Science)	.0778	.0414*	.0309*
4		.8709	.7735	.9183
Comparison 1		.1422	.3794	.0618
2	800's (Education)	.6980	.5639	.9812
3		.0022**	.0005**	.0044**

Table 18 (continued)

	Source	Multivariate	Univariate SCH/RFTE	Univariate SCH/TFTE
4		.2228	.0971	.1192
Comparison 1		.9438	.9543	.8465
2	900's (Engineering)	.9347	.9646	.8213
3		.0028**	.0048**	.0007**
4		.1801	.1579	.0637
Comparison 1[2]		.3867	.2316	.1796
2	1000's (Fine Arts)	.8246	.7813	.5566
4		.8666	.5914	.6968
Comparison 1		.0302	.1146	.6946
2	1100's (Foreign Languages)	.8176	.6731	.5256
3		.0906	.0979	.8705
4		.2149	.1571	.0811
Comparison 1[2]		.1223	.3848	.0546*
2	1300's (Home Economics)	.2514	.1125	.1346

Table 18 (continued)

	Source	Multivariate	Univariate SCH/RFTE	Univariate SCH/TFTE
4		.6895	.5762	.3893
Comparison 1		.0001**	.0059**	.0023**
2	1500's (Letters)	.0001**	.0001**	.6549
3		.5056	.2920	.2657
4		.0085**	.0062	.0028**
Comparison 1[3]		.5296	.3877	.2592
4	1600's (Library Science)	.7255	.9349	.6172
Comparison 1		.0008**	.0003**	.0480
2	1700's (Mathematics)	.0001**	.0001**	.0974
3		.0001**	.0001**	.0004**
4		.0024	.0033**	.4385
Comparison 1		.6763	.4642	.3819
2	1900's (Physical Sciences)	.0013**	.1100	.0006**
3		.0505*	.0529*	.0147**

Table 18 (continued)

	Scource	Multivariate	Univariate SCH/RFTE	Univariate SCH/TFTE
4		.3178	.2770	.1288
Comparison 1		.1188	.0748	.0437*
2	2000's (Psychology)	.0001**	.0001**	.0826**
3		.9937	.9126	.9243
4		.9192	.8354	.9210
Comparison 1		.5271	.9461	.4008
2	2100's (Public Affairs)	.0079**	.0802	.0167**
3		.5795	.3192	.3464
4		.2309	.0900	.3040
Comparison 1		.8333	.8156	.5775
2	2200's (Social Studies)	.0001**	.0001**	.1316
3		.5243	.3985	.9451

Table 18 (continued)

Scource	Multivariate	Univariate SCH/RFTE	Univariate SCH/TFTE
4	.3874	.1672	.3155

*p < .05

**p < .01

[1]Adjusted for missing cell from University One

[2]Adjusted for missing cell from University Three

[3]Adjusted for missing cells from both Universities One and Three

Of the sixty-six comparisons made (see Table 19 for an overview of the multivariate results) in the multivariate mode, three comparisons showed a significant difference at the .05 level and seventeen comparisons showed significant differences that were considered highly significant ($p < .01$). Only Architecture (0200), Business (0500), Fine Arts (1000), Home Economics (1300), and Library Science (1600) showed no significant differences when treated as multivariate. Only one statistically significant difference was found in the following HEGIS groups: Education (0800), Engineering (0900), Psychology (2000), Public Affairs (2100), and Social Sciences (2200) all $p < .01$; whereas, Foreign Languages (1100) also had only one significant difference, however, the probability of the associated F ratio was .05.

Only Mathematics (1700) was significantly different ($p < .01$) in all four comparisons and only Letters (1500s) was significantly difference in as many as three comparisons ($p < .01$). The two combined to account for 41.68 percent of the total sums of squares associated with the interaction.

These findings are indicative of an emergent pattern in differences in faculty teaching loads. It would appear that the large numbers of survey courses required of all students, as in Mathematics and English, show large differences in teaching loads; whereas, courses taught in divisions with limited enrollments have similar teaching loads when compared to the other instutions.

In the first comparison (1,2 vs. 3,4,5) 33 percent of the comparisons were considered as significantly different ($p < .01$) indicating differences in faculty teaching loads in the following divisions: Agriculture (0100), Life Sciences (0400), Computer Science (0700), Foreign Languages (1100, $p < .05$), Letters (1500), and Mathematics (1700).

In the second comparison (1 vs. 2), 44 percent of the comparisons were significantly different ($p < .05$) indicating that the presupposition of equality of teaching loads between Institutions One and Two was not well founded, this would also help to explain why comparison one (1,2 vs. 3,4,5) turned up as many significant differences as it did. Table 19 is provided for a ready reference to the significantly different comparisons. Common differences existed in the first two comparisons in the following: Life Sciences (0400), English (1500), and Mathematics (1700). This suggests that the liberal arts and science type institutions not only differ when compared to other institutions in the arts and sciences but, also, that the differ among themselves in the arts and sciences faculty teaching load.

Table 19

Summary of Significantly Different
Orthogonal Comparisons

HEGIS Group		Comparison 1 Inst's 1 & 2 vs Inst's 3,4,5	2 Inst 1 vs Inst 2	3 Inst 3 vs Inst's 4,5	4 Inst 4 vs Inst 5
0100	Agriculture	**	*	**	
0200	Architecture				
0400	Life Sciences	**	**		
0500	Business				
0600	Communications				
0700	Computer Science	**			
0800	Education			**	
0900	Engineering			**	
1000	Fine Arts				
1100	Foreign Languages	*			
1300	Home Economics				

Table 19 (continued)

HEGIS Group		Comparison 1 Inst's 1 & 2 vs Inst's 3,4,5	2 Inst 1 vs Inst 2	3 Inst 3 vs Inst's 4,5	4 Inst 4 vs Inst 5
1500	Letters	**	**		**
1600	Library Science				
1700	Mathematics	**	**	**	**
1900	Physical Sciences		**	*	
2000	Psychology		**		
2100	Public Affairs		**		
2200	Social Studies		**		

*p < .05

**p < .01

The third comparison (3 vs. 4,5) had a 28 percent rate in the significant differences ($p < .05$) by divisions. As in the first two comparisons, no real pattern emerged in the differences.

Comparison 4 (4 vs. 5) had only two significant differences ($p < .01$) occur overall. This is indicative of highly correlated teaching loads between the two universities.

Partial confounding was present in the comparisons due to missing cells in the analysis. Whereas, seventy-two comparisons could have been made, four for each division, only sixty-six were made due to six missing cells.

Chapter 5

SUMMARY, FINDINGS, AND RECOMMENDATIONS

Summary

It was the purpose of this study to analyze the faculty teaching load data among five cooperating institutions. The study attempted to answer the following questions:

1. Are there significant differences in ranked faculty teaching loads among different universities?

2. Are there significant differences in ranked faculty teaching loads within the divisions among the different universities?

3. Is there a significant interaction among the universities based on ranked faculty teaching load?

4. Is there a significant interaction among the universities when ranked faculty teaching load and total teaching load are considered as a p-tuple multivariate?

5. Given a significant interaction, do the pre-planned orthogonal comparisons isolate the significant differences between the institutions when compared by the divisions?

The sample for this study consisted of five institutions of higher education that participated in a data exchange over a two year period. Because of the

confidential nature of the exchanged information, these institutions were only distinguished in the study through the use of numeric codes.

Data for this study were obtained from the individual institutions over a two year period and were based on the census date for the Fall semesters. Upon receipt of the data, the data were coded and subsequently key-punched onto IBM cards for processing on the IBM 360-65 computer. In order to test the null hypothesis of no significant differences among the means, a multivariate analysis of variance was utilized with the data cast into a factorial arrangement and with orthogonal comparisons built into the interaction effect.

Findings

Within the limitations of this study, the following findings appear justified:

1. General

Faculty teaching loads differed from institution to institution; from division to division, and from divisional counterpart to divisional counterpart. One or some combination of the factors listed below may attribute to the differences in teaching load found in this study:

a. Size of Institution. The smallest university in terms of student enrollment had the largest overall SCH/RFTE production; however, the largest of the universities studied did not have the lowest overall SCH/RFTE

ratio. However, it would seem reasonable that a smaller university in terms of enrollment would generate less funds from not only tuition but also from state general aid. Therefore, a small university would be getting proportionately less money for faculty salaries and, as a consequence, would have less faculty teaching more students because proportionately greater amounts of their budgets are going toward fixed costs and operating expenses. This would be particularly true if two universities were of equal size in their physical plants and thus shared identical operating costs and one of the two universities experienced a decline in enrollment. The costs for operating the universities would remain fairly constant, however, there would be less money for the university experiencing a decline in enrollment to pay them and a variable cost such as salaries would be adversely affected.

b. Disparity in Use of Teaching Assistants. The use of teaching assistants would cause a wide disparity in divisional teaching loads among ranked faculty as it is a common practice to have ranked faculty teaching upper division and graduate courses on a limited enrollment type basis; whereas, the teaching assistants are assigned, in many instances, the lower division survey courses required of all students. If one university does not use assistants or if one division within a university does not use them, significant differences would occur. When the variable SCH/TFTE was included in the multivariate analysis, the

differences in teaching loads was not, however, appreciably affected. This would indicate that the five universities included in this study, used their teaching assistants in a similar manner or that the use of teaching assistants in the calculation of the SCH/TFTE ratio was of minor importance. The latter was not the case in this study as teaching assistants accounted for an average of 22.8 percent of the Total FTE (see Table 5).

c. Competitiveness of Surrounding Institutions. When institutions of similar competitiveness with surrounding institutions were compared with each other, significant differences were found among the two. As a factor in teaching load differentiation, this is inconclusive for the two institutions should have been similar if competitiveness with surrounding institutions was a factor.

d. Overall Student Faculty Ratio. The two schools most similar in this respect, were found to differ signifcantly in overall teaching load in a majority of the divisional levels. Once again, this is inconclusive for if the overall student faculty ratio were a factor then the two schools should have been more similar in their divisional teaching loads.

e. Faculty Salaries. Same as c and d above.

f. Yearly Changes. Results from the analysis of variance suggest that faculty teaching loads may also vary on a year to year basis. It is suspected that if more than

two years data were used in a similar study, that annual changes in faculty teaching loads would be less appreciably affected.

g. Other. Other sources of variation not investigated in this study might be: similarities in scope and mission; funding of programs; state legislation; and errors made in collection, collation and tabulation of the credit enrollment forms by individual institutions.

2. Specific

a. The null hypothesis of no significant differences in mean faculty teaching loads among the institutions was rejected as the differences were highly significant ($p < .01$).

b. The null hypothesis of no significant differences among the divisions was also rejected as the chances of obtaining a sample so different from what would be expected under the condition of a true null hypothesis would be less than 1 chance in 100.

c. It was found that the interaction was highly significant ($p < .01$). The significance of the interaction between Division and Institution was enough to produce a multivariate interaction.

d. Orthogonal comparisons indicated that Institutions One and Two were significantly different ($p < .05$) in eight out of eighteen compared divisions. Institutions Four and Five differed in only two of eighteen compared

divisions. Correspondingly, when Institutions One and Two were compared with Institutions Three, Four, and Five six significant differences in mean faculty teaching load were found. The third comparison indicated that Institution Three differed from Four and Five in four divisions. Throughout the orthogonal comparisons the 0200s (Architecture), 0500s (Business), 0600s (Communications), 1000s (Fine Arts), 1300s (Home Economics), and 1600s (Library Science) showed no significant differences; whereas, only the 1700s (Mathematics) showed significant differences in all four comparisons.

Recommendations

From the results of this study, the following recommendations are proffered:

1. Whereas this study found significant differences, it is recommended that at least four to five years data be used in calculating the means. Given a more-or-less fixed sample standard deviation, the standard error of the mean could be made smaller by increasing the size of the sample.

2. To avoid errors in collection and reporting of data at the individual institutions, it would be advisable to have an individual or team collect and collate the individual data from the various institutions; thus, avoiding unintended misrepresentation of data to the host institution.

3. The next step in a study of faculty teaching load should strive for an analysis of faculty teaching load by four digit HEGIS code.

4. It would be commendable in a study of faculty teaching load to have the FTE faculty broken out by not only ranked faculty and teaching assistants; but also, by FTE faculty teaching graduate courses and upper/lower division undergraduate courses.

5. A further refinement in a study of faculty teaching load, would be to have the ranked faculty FTE reported in terms of each rank (i.e., full, associate, assistant professor, etc.).

6. A further recommendation would be that a study be conducted using "annualized" student credit hours. While the academic year differs in precise length from institution to institution, there is an accepted and conventional conceptualization of the academic year as being a calendar period going from the fall of the year to the late spring of the following year, during which time an enrolled student completes one year of a four-year program. The use of annualized SCHs in a study of faculty teaching load may be more indicative of divisional teaching loads for comparison purposes across institutions.

7. Historically, full-time equivalent faculty (FTE) have been the most common measure of teaching manpower; however, at some institutions, the time period involved is 11 or 12 months; at others the period may be

as short as 8 months. It is recommended that a study be conducted using the concept of service-months in an attempt to avoid that issue by focusing only on the numerator of the following calculation and leaving the selection of the appropriate value of the denominator of the user.

FTE = Service-months/Service-months per FTE

The concept of service-months is consistent with the widely accepted concept of FTE while avoiding the problems associated with the common agreement about the value of the denominator in the FTE calculation.

REFERENCES

Aldrich, L. J. "An Index System for Equating Junior College Faculty Efforts." August, 1967. ED 014 977.

Ayer, F. C. "Computing and Adjusting the University Teaching Load." Nation's Schools, July, 1929, pp. 26-30.

Barr, Anthony J., James H. Goodnight, John P. Sall, and Jane T. Helwig. A User's Guide to SAS. Raleigh, North Carolina: SAS Institute, Inc., 1976.

Biglan, A. "Relationships Between Subject Matter Characteristics and the Structure and Output of University Departments." Journal of Applied Psychology, 67 (3), 204-213.

Blee, M. R. "The Use of Faculty Load Data in Interinstitutional Analysis." In Faculty Workload, edited by K. Bunnell. Washington, D. C.: American Council on Education, 1960.

Bock, D. R. "Programming Univariate and Multivariate Analysis of Variance." Technometrics, 5 (1963), pp. 95-117.

Bolton, D. L. "Measuring Faculty Load." Improving College and University Teaching. 13 (1965), pp. 157-158.

Bunnell, Kevin (ed.). Faculty Workload. Washington, D. C.: American Council on Education, 1960.

Campbell, D. T. and D. Fiske. "Convergent and Discriminant Validation by the Multitrait-Multimethod Matrix." Psychological Bulletin, 56 (1959), pp. 81-105.

Cannell, L. D. "Apportioning Straws to Camels' Backs." Junior College Journal, (September, 1959), pp. 3-5.

Caplow, T. "The Dynamics of Faculty Load Studies." In Faculty Workload, edited by K. Bunnell. Washington, D. C.: American Council on Education, 1960.

Carter, Allan Murray. The Carnegie Commission on Higher Education, New York: McGraw-Hill, 1969.

Cochran, William G. and Gertrude M. Cox. Experimental Designs. New York: John Wiley and Sons, Inc., 1957.

The College Blue Book, Fifteenth Edition. New York: Macmillan Publishing Company, 1975.

Curtis, William H. Educational Resources Management System. Chicago: Research Corporation of the Association of School Business Officials, 1971.

Davis, C. O. "The Teaching Load in a University." School and Society, (May, 1924), pp. 556-558.

Doi, James. "The Proper Use of Faculty Load Studies." In Studies of College Faculty, Boulder, Colorado: Western Interstate Commission for Higher Education, 1961.

_____. "The Use of Faculty Load Data Within an Institution." In Faculty Workload, edited by K. Bunnell. Washington, D. C.: American Council on Education, 1960.

Douglass, Harl R. and W. T. Gruhn. "Teaching Load." In Encyclopedia of Educational Research, edited by W. S. Monroe, New York: Macmillan Co., 1941, pp. 1257-1264.

_____, and Stephen Romine. "Teaching Load." In Encyclopedia of Educational Research, edited by W. S. Monroe. Revised edition. New York: Macmillan Co., 1950, pp. 1454-1461.

Dressel, P. L. Handbook of Institutional Research. San Francisco: Jossey-Bass, 1971.

_____, and W. H. Farley. Return to Responsibility. San Francisco: Jossey-Bass, 1974.

_____, and L. Simon. "Allocating Resources Among Departments." In New Directions for Institutional Research, edited by Sidney Suslow and Paul Jedamus. San Francisco: Jossey-Bass, 1976. Number 11.

Drews, T. and S. Drews. "HEGIS: A report on Status and Plans." In Management and Information Systems in Higher Education, edited by C. B. Johnson and W. G. Katzenmeyer. Durham, North Carolina: Duke University Press, 1969.

Durham, G. H. "The Uses and Abuses of Faculty Load Data." In Faculty Workload, edited by K. Bunnell. Washington, D. C.: American Council on Education, 1960.

Ebel, Robert. "Essentials of Educational Measurement." In Encyclopedia of Educational Research. Englewood Cliffs, N. J.: Prentice-Hall, 1972.

El Camino College Teacher Load Study Committee. "Study of Teacher Load Practices in California Public Junior Colleges." 1963. ED 012 593.

Elkins, Wilson H. Report of the President, 1975-1976. University of Maryland.

Evans, John M. "The Credit Hour Doesn't Provide a Sound Basis for Measuring the Teaching Load." College and University, January, 1957, pp. 42-43.

Ferguson, George A. Statistical Analysis in Psychology and Education. New York: McGraw-Hill, Inc., 1971.

Firnberg, James W. Speech given at the AIR Forum in Montreal, Canada, in May, 1977.

_____, and Stephen W. Ahrens. "Enrollment Projections Based on an Analysis of Births, Louisiana High School Graduates, and Freshmen in the Louisiana State University System." Louisiana Education Research Journal, Spring/Fall, 1977, pp. 5-10.

Hall, Charles E. "Some Elements of the Design of Multivariate Experiments." The Journal of Experimental Education, Summer, 1977, pp. 26-37.

Hauck, G. F. "Estimating Faculty Workload." Engineering Education, October, 1969, pp. 117-119.

Henle, R. J. "Systems for Measuring and Reporting the Resources and Activities of Colleges and Universities." Washington, D. C.: National Science Foundation, 1967. ED 016 309.

Hicks, John W. "Faculty Workload-An Overview." Faculty Workload, edited by K. Bunnell. Washington, D. C.: American Council on Education, 1960.

Hill, Armin J. "Measuring Faculty Workload." Journal of Engineering Education, October, 1969, pp. 92-96.

Hopkins, K. D. and W. G. Rogers. "The Congruence of Experimental Design with Statistical Analysis: Power and External Validty Considerations from Multiple One-Way ANOVAs versus a Factorial Design." Journal of Special Education, 5 (1971), pp. 201-204.

Hodges, Arthur C. "Faculty Activity Analysis of Selected Institutions--A Case Study." An unpublished Ed.D. dissertation, West Virginia University, 1977.

Kelley, F. J. "Relative Amounts of Time Required for Teaching Different College Courses." Journal of Educational Research, 13 (1926), pp. 273-283.

Kerlinger, Frederick. Foundation of Behavioral Research, 2nd Edition. New York: Holt, Rinehart and Winston, 1973.

Kerr, Clark. Speech at the annual conference of the American Association for Higher Education, 1971.

Knowles, Asa S. and W. C. White. "Evaluation of Faculty Loads in Institutions of Higher Learning." Journal of Engineering Education, June, 1939, pp. 798-810.

Koos, L. V. The Adjustment of the Teaching Load in a University. Department of the Interior, Bureau of Education, Bulletin No. 15, Washington, D. C.: Government Printing Office, 1919.

Lambert, S. M. and D. Iwamato. "Teaching Load." Encyclopedia of Educational Research, edited by C. W. Harris. 3rd. edition, rev., New York: Macmillan Co., 1960, pp. 1496-1502.

Lorents, Alden C. "Faculty Activity Analysis and Planning Models in Higher Education." St. Paul, Minnesota: Higher Education Coordinating Commission, 1971. ED 055 571.

Manning, Charles W. Faculty Activity Analysis: Interpretation and Uses of Data. Boulder, Colorado: Western Interstate Commission for Higher Education, 1974.

_____, and Leonard C. Romney. Faculty Activity Analysis: Procedures Manual. Boulder, Colorado: Western Interstate Commission for Higher Education, 1973. HE 004 891.

Mayhew, Lewis B. The Carnegie Commission on Higher Education. San Francisco: Jossey-Bass, 1973.

_____. Graduate and Professional Education, 1980. New York: McGraw Hill Book Company, 1970.

Michell, E. M. "Need for Time Analysis of Instruction." Journal of Higher Education, June, 1937, pp. 311-314.

Miller, K. C. "A Study of Faculty Workload in Higher Education." Ph.D. dissertation, University of Mississippi, 1968.

Millman, J. and G. V. Glass. "Rules of Thumb for Writing the ANOVA Table." Journal of Educational Measurement, 4 (1967), pp. 41-51.

Mims, Sue and Donald LeLong. "Michigan Peer Institutions Information Study." In New Directions for Institutional Research 12, edited by Marvin W. Peterson. San Francisco: Jossey-Bass, 1976.

Murrill, Paul. Memorandum to Vice Chancellors and Academic Deans, Louisiana State University, April 17, 1975.

National Education Association. "Faculty Load Policies and Practices in Colleges and Universities." July, 1972. ED 068 029.

Neter, John and William Wasserman. Applied Linear Statistical Models. Homewood, Illinois: Richard D. Irwin, Inc., 1975.

Ohio, Interuniversity Council of. Faculty Load Study. Columbus, 1970.

Pace, C. Robert. "Standardized Instruments for Institutional Assessment." New Directions for Institutional Research, Winter, 1976, pp. 1-15.

Peterson, Marvin (ed.). "Benefitting from Interinstitutional Research." In New Directions for Institutional Research 12. San Francisco: Jossey-Bass, 1976.

Reeves, F. W. and J. D. Russell. College Organization and Administration. Indianapolis: Board of Education, Disciples of Christ, 1929.

_____, et. al. The University Faculty. Chicago: University of Chicago Press, 1933.

Richardson, H. D. "Faculty Workload Study and Analysis." College and University, Fall, 1967, pp. 108-114.

Ritchey, J. A. "Utilization of Engineering Faculty Time." Journal of Engineering Education, December, 1959, pp. 244-250.

Romney, Leonard C. "Faculty Activity Analysis: Overview and Major Issues." Boulder, Colorado: Western Interstate Commission for Higher Education, 1971. ED 062 947.

Ruml, B. and D. H. Morrison. Memo to a College Trustee. New York: McGraw Hill, 1959.

Sexson, J. E. "A Method for Computing Faculty Load." Improving College and University Teaching, Autumn, 1967, pp. 219-222.

Simmons, J. C. "What Is a Full Time Equivalent (FTE) Faculty Unit?" College and University, Fall, 1970, pp. 33-36.

Stewart, L. O. "Teaching Loads-Their Measurement and Calculation." Journal of Engineering Education. November, 1934, pp. 225-239.

Stecklein, John E. How to Measure Faculty Workload. Washington, D. C.: American Council on Education, 1961.

_____. "Methods of Analyzing, Expressing, and Reporting Faculty Load Data." In Faculty Workload, edited by K. Bunnell. Washington, D. C.: American Council on Education, 1960.

Stickler, W. H. "Working Material and Bibliography on Faculty Load." In Faculty Workload, edited by K. Bunnell. Washington, D. C.: American Council on Education, 1960.

Toombs, W. Productivity: Burden of Success. ERIC/Higher Education Research Report Number 2. Washington, C. C.: American Association for Higher Education, 1973. ED 076 174.

"Two Professors Arrested at Lincoln University." The Chronicle of Higher Education. Volume XV, Number 5, October 3, 1977.

University of California, Office of the President. Faculty Effort and Output Study. Berkeley: University of California Press, 1970.

Wallhaus, Robert A. "The Many Directions of Productivity." In New Directions for Institutional Research 8, edited by Sidney Suslow and Paul Jedamus. San Francisco: Jossey-Bass, 1976.

Williams, Robert L. "The Faculty Workload-Alternative Methods of Evaluation." Denver, Colorado: Education Commission of the States, 1970. ED 051 792.

Wilson, L. Academic Man. New York: Oxford University Press, 1942.

Winer, B. J. Statistical Analysis in Experimental Design. New York: McGraw Hill, 1971.

Woodburne, L. S. Principles of College and University Administration. Stanford, California: Stanford University Press, 1958.

Yuker, Harold E. Faculty Workload: Facts, Myths and Commentary. ERIC/Higher Education Research Report Number 6. Washington, D. C.: American Association for Higher Education, 1974.

Appendix A

NUMERICAL LISTING OF HEGIS DISCIPLINES

PROGRAM (DISCIPLINE) SUBCATEGORIES

0000 GENERAL USE

0100 AGRICULTURE AND NATURAL RESOURCES
- 0101 Agriculture, General
- 0102 Agronomy (Field Crops, and Crop Management)
- 0103 Soils Science (Management and Conservation)
- 0104 Animal Science (Husbandry)
- 0105 Dairy Science (Husbandry)
- 0106 Poultry Science
- 0107 Fish, Game, and Wildlife Management
- 0108 Horticulture (Fruit and Vegetable Production)
- 0109 Ornamental Horticulture (Floriculture, Nursery Science)
- 0110 Agricultural and Farm Management
- 0111 Agricultural Economics
- 0112 Agricultural Business
- 0113 Food Science and Technology
- 0114 Forestry
- 0115 Natural Resources Management
- 0116 Agriculture and Forestry Technologies
- 0117 Range Management
- 0199 Other, Specify

0200 ARCHITECTURE AND ENVIRONMENTAL DESIGN
- 0201 Environmental Design, General
- 0202 Architecture
- 0203 Interior Design
- 0204 Landscape Architecture
- 0205 Urban Architecture
- 0206 City, Community, and Regional Planning
- 0299 Other, Specify

0300 AREA STUDIES
- 0301 Asian Studies, General
- 0302 East Asian Studies
- 0303 South Asian (India, etc.) Studies
- 0304 Southeast Asian Studies
- 0305 African Studies
- 0306 Islamic Studies
- 0307 Russian and Slavic Studies
- 0308 Latin American Studies
- 0309 Middle Eastern Studies
- 0310 European Studies, General
- 0311 Eastern European Studies
- 0312 West European Studies
- 0313 American Studies
- 0314 Pacific Area Studies
- 0399 Other, Specify

0400 BIOLOGICAL SCIENCES
- 0401 Biology, General
- 0402 Botany, General
- 0403 Bacteriology
- 0404 Plant Pathology
- 0405 Plant Pharmacology
- 0406 Plant Physiology
- 0407 Zoology, General
- 0408 Pathology, Human and Animal
- 0409 Pharmacology, Human and Animal
- 0410 Physiology, Human and Animal
- 0411 Microbiology
- 0412 Anatomy
- 0413 Histology
- 0414 Biochemistry
- 0415 Biophysics
- 0416 Molecular Biology
- 0417 Cell Biology (Cytology, Cell Physiology)
- 0418 Marine Biology
- 0419 Biometrics and Biostatistics
- 0420 Ecology
- 0421 Entomology
- 0422 Genetics
- 0423 Radiobiology
- 0424 Nutrition, Scientific (exclude Nutrition in Home Economics and Dietetics)

0425 Neurosciences
0426 Toxicology
0427 Embryology
0499 Other, Specify

0500 BUSINESS AND MANAGEMENT
0501 Business and Commerce, General
0502 Accounting
0503 Business Statistics
0504 Banking and Finance
0505 Investments and Securities
0506 Business Management and Administration
0507 Operations Research
0508 Hotel and Restaurant Management
0509 Marketing and Purchasing
0510 Transportation and Public Utilities
0511 Real Estate
0512 Insurance
0513 International Business
0514 Secretarial Studies
0515 Personnel Management
0516 Labor and Industrial Relations
0517 Business Economics
0599 Other, Specify

0600 COMMUNICATIONS
0601 Communications, General
0602 Journalism (Printed Media)
0603 Radio/TV
0604 Advertising
0605 Communication Media
(use of videotape, film, etc., oriented specifically toward radio/TV)
0699 Other, Specify

0700 COMPUTER AND INFORMATION SCIENCES
0701 Computer and Information Sciences, General
0702 Information Sciences and Systems
0703 Data Processing
0704 Computer Programming
0705 Systems Analysis
0799 Other, Specify

0800 EDUCATION
0801 Education, general
0802 Elementary education, general
0803 Secondary education, general
0804 Junior high school education
0805 Higher education, general
0806 Junior and community college education
0807 Adult and continuing education
0808 Special education, general
0809 Administration of special education
0810 Education of the mentally retarded
0811 Education of the gifted
0812 Education of the deaf
0813 Education of the culturally disadvantaged
0814 Education of the visually handicapped
0815 Speech correction
0816 Education of the emotionally disturbed
0817 Remedial education
0818 Special learning disabilities
0819 Education of the physically handicapped
0820 Education of the multiple handicapped
0821 Social foundations (history and philosophy of education)
0822 Educational psychology (include learning theory)
0823 Pre-elementary education (kindergarten)
0824 Educational statistics and research
0825 Educational testing, evaluation, and measurement
0826 Student personnel (counseling and guidance)
0827 Educational administration
0828 Educational supervision
0829 Curriculum and instruction
0830 Reading education (methodology and theory)
0831 Art education (methodology and theory)
0832 Music education (methodology and theory)
0833 Mathematics education (methodology and theory)
0834 Science education (methodology and theory)
0835 Physical education
0836 Driver and safety education
0837 Health education (include family life education)
0838 Business, commerce, and distributive education
0839 Industrial arts, vocational, and technical education
0899 Other, specify

0900 ENGINEERING
0901 Engineering, General
0902 Aerospace, Aeronautical, and Astronautical Engineering
0903 Agricultural Engineering
0904 Architectural Engineering
0905 Bioengineering and Biomedical Engineering
0906 Chemical Engineering (include Petroleum Refining)
0907 Petroleum Engineering (exclude Petroleum Refining)
0908 Civil, Construction, and Transportation Engineering
0909 Electrical, Electronics, and Communications Engineering
0910 Mechanical Engineering
0911 Geological Engineering
0912 Geophysical Engineering
0913 Industrial and Management Engineering
0914 Metallurgical Engineering
0915 Materials Engineering
0916 Ceramic Engineering
0917 Textile Engineering
0918 Mining and Mineral Engineering
0919 Engineering Physics
0920 Nuclear Engineering
0921 Engineering Mechanics
0922 Environmental and Sanitary Engineering
0923 Naval Architecture and Marine Engineering
0924 Ocean Engineering

0925 Engineering Technologies
0999 Other, Specify

1000 FINE AND APPLIED ARTS
1001 Fine Arts, General
1002 Art (Painting, Drawing, Sculpture)
1003 Art History and Appreciation
1004 Music (Performing, Composition, Theory)
1005 Music (Liberal Arts Program)
1006 Music History and Appreciation (Musicology)
1007 Dramatic Arts
1008 Dance
1009 Applied Design (Ceramics, Weaving, Textile Design, Fashion Design, Jewelry, Metalsmithing, Interior Decoration, Commercial Art)
1010 Cinematography
1011 Photography
1099 Other, Specify

1100 FOREIGN LANGUAGES
1101 Foreign Languages, General
1102 French
1103 German
1104 Italian
1105 Spanish
1106 Russian
1107 Chinese
1108 Japanese
1109 Latin
1110 Greek, classical
1111 Hebrew
1112 Arabic
1113 Indian (Asiatic)
1114 Scandinavian Languages
1115 Slavic Languages (other than Russian)
1116 African Languages (non-Semitic)
1199 Other, Specify

1200 HEALTH PROFESSIONS
1201 Health Professions, General
1202 Hospital and Health Care Administration
1203 Nursing
1204 Dentistry
1205 Dental Specialties
1206 Medicine
1207 Medical Specialties
1208 Occupational Therapy
1209 Optometry
1210 Osteopathic Medicine
1211 Pharmacy
1212 Physical Therapy
1213 Dental Hygiene
1214 Public Health
1215 Medical Record Librarianship
1216 Podiatry or Podiatric Medicine
1217 Biomedical Communication
1218 Veterinary Medicine
1219 Veterinary Medicine Specialties
1220 Speech Pathology and Audiology
1221 Chiropractic
1222 Clinical Social Work
1223 Medical Laboratory Technologies
1224 Dental Technologies
1225 Radiologic Technologies
1299 Other, Specify

1300 HOME ECONOMICS
1301 Home Economics, General
1302 Home Decoration and Home Equipment
1303 Clothing and Textiles
1304 Consumer Economics and Home Management
1305 Family Relations and Child Development
1306 Foods and Nutrition (include Dietetics)
1307 Institutional Management and Cafeteria Management
1399 Other, Specify

1400 LAW
1401 Law, General
1499 Other, Specify

1500 LETTERS
1501 English, General
1502 Literature, English
1503 Comparative Literature
1504 Classics
1505 Linguistics (include Phonetics, Semantics, and Philology)
1506 Speech, Debate, and Forensic Science (Rhetoric and Public Address)
1507 Creative Writing
1508 Teaching of English as a Foreign Language
1509 Philosophy
1510 Religious Studies (exclude Theological Professions)
1599 Other, Specify

1600 LIBRARY SCIENCE
1601 Library Science, General
1699 Other, Specify

1700 MATHEMATICS
1701 Mathematics, General
1702 Statistics, Mathematical and Theoretical
1703 Applied Mathematics
1799 Other, Specify

1800 MILITARY SCIENCES
1801 Military Science (Army)
1802 Naval Science (Navy, Marines)
1803 Aerospace Science (Air Force)
1899 Other, Specify

1900 PHYSICAL SCIENCES
1901 Physical Sciences, General
1902 Physics, General (exclude Biophysics)
1903 Molecular Physics
1904 Nuclear Physics
1905 Chemistry, General (exclude Biochemistry)
1906 Inorganic Chemistry
1907 Organic Chemistry
1908 Physical Chemistry
1909 Analytical Chemistry
1910 Pharmaceutical Chemistry
1911 Astronomy
1912 Astrophysics
1913 Atmospheric Sciences and Meteorology
1914 Geology
1915 Geochemistry
1916 Geophysics and Seismology
1917 Earth Sciences, General
1918 Paleontology
1919 Oceanography
1920 Metallurgy
1999 Other, Specify

2000 PSYCHOLOGY
- 2001 Psychology, General
- 2002 Experimental Psychology (animal and human)
- 2003 Clinical Psychology
- 2004 Psychology for Counseling
- 2005 Social Psychology
- 2006 Psychometrics
- 2007 Statistics in Psychology
- 2008 Industrial Psychology
- 2009 Developmental Psychology
- 2010 Physiological Psychology
- 2099 Other, Specify

2100 PUBLIC AFFAIRS AND SERVICES
- 2101 Community Services, General
- 2102 Public Administration
- 2103 Parks and Recreation Management
- 2104 Social Work and Helping Services (other than Clinical Social Work)
- 2105 Law Enforcement and Corrections
- 2106 International Public Service (other than Diplomatic Service)
- 2199 Other, Specify

2200 SOCIAL SCIENCES
- 2201 Social Sciences, General
- 2202 Anthropology
- 2203 Archeology
- 2204 Economics
- 2205 History
- 2206 Geography
- 2207 Political Science and Government
- 2208 Sociology
- 2209 Criminology
- 2210 International Relations
- 2211 Afro-American (Black Culture) Studies
- 2212 American Indian Cultural Studies
- 2213 Mexican-American Cultural Studies
- 2214 Urban Studies
- 2215 Demography
- 2299 Other, Specify

2300 THEOLOGY
- 2301 Theological Professions, General
- 2302 Religious Music
- 2303 Biblical Languages
- 2304 Religious Education
- 2399 Other, Specify

4900 INTERDISCIPLINARY STUDIES
- 4901 General Liberal Arts and Sciences
- 4902 Biological and Physical Sciences
- 4903 Humanities and Social Sciences
- 4904 Engineering and Other Disciplines
- 4999 Other, Specify

5000 BUSINESS AND COMMERCE TECHNOLOGIES
- 5001 Business and Commerce Technologies, General
- 5002 Accounting Technologies
- 5003 Banking and Finance Technologies
- 5004 Marketing, Distribution, Purchasing, Business, and Industrial Management Technologies
- 5005 Secretarial Technologies (include Office Machines Training)
- 5006 Personal Service Technologies (Stewardess, Cosmetologist, etc.)
- 5007 Photography Technologies
- 5008 Communications and Broadcasting Technologies (Radio/TV, Newspapers)
- 5009 Printing and Lithography Technologies
- 5010 Hotel and Restaurant Management Technologies
- 5011 Transportation and Public Utility Technologies
- 5012 Applied Arts, Graphic Arts, and Fine Arts Technologies (include advertising design)
- 5099 Other, Specify

5100 DATA PROCESSING TECHNOLOGIES
- 5101 Data Processing Technologies, General
- 5102 Key Punch Operator and Other Input Preparation Technologies
- 5103 Computer Programmer Technologies
- 5104 Computer Operator and Peripheral Equipment Operation Technologies
- 5105 Data Processing Equipment Maintenance Technologies
- 5199 Other, Specify

5200 HEALTH SERVICES AND PARAMEDICAL TECHNOLOGIES
- 5201 Health Services Assistant Technologies, General
- 5202 Dental Assistant Technologies
- 5203 Dental Hygiene Technologies
- 5204 Dental Laboratory Technologies
- 5205 Medical or Biological Laboratory Assistant Technologies
- 5206 Animal Laboratory Assistant Technologies
- 5207 Radiologic Technologies (X-Ray, etc.)
- 5208 Nursing, R.N. (less than 4-year program)
- 5209 Nursing, Practical (L.P.N. or L.V.N.—less than 4-year program)
- 5210 Occupational Therapy Technologies
- 5211 Surgical Technologies
- 5212 Optical Technologies (include Ocular Care, Ophthalmic, Optometric Technologies)
- 5213 Medical Record Technologies
- 5214 Medical Assistant and Medical Office Assistant Technologies
- 5215 Inhalation Therapy Technologies
- 5216 Psychiatric Technologies (include Mental Health Aide Programs)
- 5217 Electro Diagnostic Technologies (include E.K.G., E.E.G., etc.)
- 5218 Institutional Management Technologies (Rest Home, etc.)
- 5219 Physical Therapy Technologies
- 5299 Other, Specify

5300 MECHANICAL AND ENGINEERING TECHNOLOGIES
- 5301 Mechanical and Engineering Technologies, General
- 5302 Aeronautical and Aviation Technologies
- 5303 Engineering Graphics (Tool and Machine Drafting and Design)
- 5304 Architectural Drafting Technologies
- 5305 Chemical Technologies (include Plastics)
- 5306 Automotive Technologies
- 5307 Diesel Technologies
- 5308 Welding Technologies

5309 Civil Technologies (Surveying, Photogrammetry, etc.)
5310 Electronics and Machine Technologies (TV, Appliance, Office Machine Repair, etc.)
5311 Electromechanical Technologies
5312 Industrial Technologies
5313 Textile Technologies
5314 Instrumentation Technologies
5315 Mechanical Technologies
5316 Nuclear Technologies
5317 Construction and Building Technologies (Carpentry, Electrical Work, Plumbing, Sheet Metal, Air Conditioning, Heating, etc.)
5399 Other, Specify

5400 NATURAL SCIENCE TECHNOLOGIES
5401 Natural Science Technologies, General
5402 Agriculture Technologies (include Horticulture)
5403 Forestry and Wildlife Technologies (include Fisheries)
5404 Food Services Technologies
5405 Home Economics Technologies
5406 Marine and Oceanographic Technologies
5407 Laboratory Technologies, General
5408 Sanitation and Public Health Inspection Technologies (Environmental Health Technologies)
5499 Other, Specify

5500 PUBLIC SERVICE RELATED TECHNOLOGIES
5501 Public Service Technologies, General
5502 Bible Study or Religion-Related Occupations
5503 Education Technologies (Teacher Aide and 2-year Teacher Training Programs)
5504 Library Assistant Technologies
5505 Police, Law Enforcement, Corrections Technologies
5506 Recreation and Social Work Related Technologies
5507 Fire Control Technology
5508 Public Administration and Management Technologies
5599 Other, Specify

APPENDIX B

ALPHABETICAL LISTING OF HEGIS DISCIPLINES

Section I:

CONVENTIONAL ACADEMIC SUBDIVISIONS OF KNOWLEDGE AND TRAINING

Title	*Code*
Accounting	0502
Administration, business	0506
Administration, educational	0827
Administration, public	2102
Administration, special education	0809
Adult education	0807
Advertising	0604
Aeronautical engineering	0902
Aerospace engineering	0902
Aerospace science	1803
African languages (non-Semitic)	1116
African studies	0305
Afro-American studies	2211
Agricultural business	0112
Agricultural economics	0111
Agricultural engineering	0903
Agricultural management	0110
Agriculture, general	0101
Agriculture technologies	0116
Agronomy	0102
American Indian cultural studies	2212
American studies	0313
Analytical chemistry	1909
Anatomy	0412
Animal science	0104
Anthropology	2202
Applied design	1009
Applied mathematics	1703
Arabic	1112
Archeology	2203
Architectural engineering	0904
Architecture	0202
Architecture, naval	0923
Art	1002
Art appreciation	1003
Art, commercial	1009
Art education	0831
Art history	1003
Asian studies, general	0301
Astronautical engineering	0902
Astronomy	1911
Astrophysics	1912
Atmospheric sciences	1913
Audiology	1220
Bacteriology	0403
Banking	0504
Biblical languages	2303
Biochemistry	0414
Bioengineering	0905
Biological and physical sciences (interdisciplinary)	4902
Biology, cellular	0417
Biology, general	0401
Biology, marine	0418
Biology, molecular	0416
Biomedical communication	1217
Biomedical engineering	0905
Biometrics	0419
Biophysics	0415
Biostatistics	0419
Black culture studies	2211
Botany, general	0402
Business administration	0506
Business, agricultural	0112
Business economics	0517
Business education	0838
Business, general	0501
Business, international	0513
Business management	0506
Business statistics	0503
Cafeteria management	1307
Catalan	1199
Cell biology	0417
Cell physiology	0417
Ceramic engineering	0916
Ceramics	1009
Chemical engineering	0906
Chemistry, general	1905
Child development	1305
Chinese	1107
Chiropractic	1221
Cinematography	1010
City planning	0206
Civil engineering	0908
Classics	1504
Clinical psychology	2003
Clinical social work	1222
Clothing	1303
Commerce education	0838
Commerce, general	0501
Commercial art	1009
Communication media	0605
Communications, general	0601
Communications engineering	0909
Community college education	0806
Community planning	0206
Community services, general	2101
Comparative literature	1503
Computer programming	0704
Computer sciences, general	0701
Construction engineering	0908
Consumer economics	1304
Continuing education	0807
Corrections	2105
Counseling, educational	0826
Counseling, psychology for	2004
Creative writing	1507
Criminology	2209
Crop management	0102
Curriculum	0829
Cytology	0417
Dairy sciences	0105
Dance	1008
Danish	1114
Data processing	0703
Debate	1506

Demography 2215
Dental hygiene 1213
Dental specialties 1205
Dental technologies 1224
Dentistry, D.D.S. or D.M.D. degree 1204
Developmental psychology 2009
Dietetics 1306
Distributive education 0838
Dramatic arts 1007
Drawing 1002
Driver education 0836

Earth sciences, general 1917
East Asian studies 0302
Eastern European studies 0311
Ecology 0420
Economics 2204
Economics, agricultural 0111
Economics, business 0517
Education of the culturally disadvantaged 0813
Education of the deaf 0812
Education of the emotionally disturbed 0816
Education, general 0801
Education of the gifted 0811
Education of mentally retarded 0810
Education of the multiple handicapped 0820
Education of the physically handicapped 0819
Education, religious 2304
Education of the visually handicapped 0814
Educational administration 0827
Educational evaluation 0825
Educational measurement 0825
Educational psychology 0822
Educational research 0824
Educational statistics 0824
Educational supervision 0828
Educational testing 0825
Electrical engineering 0909
Electronics engineering 0909
Elementary education, general 0802
Embryology 0427
Engineering, general 0901
Engineering mechanics 0921
Engineering and other disciplines (interdisciplinary) 4904
Engineering physics 0919
Engineering technologies 0925
English as a foreign language 1508
English, general 1501
English, literature 1502
Entomology 0421
Environmental design, general 0201
Environmental engineering 0922
European studies, general 0310
Experimental psychology (animal and human) 2002

Family life education 0837
Family relations 1305
Farm management 0110
Fashion design 1009
Field crops 0102
Finance 0504
Fine arts, general 1001
Finnish 1199
Fish management 0107
Floriculture 0109
Foods and nutrition 1306
Food science 0113
Food technology 0113
Foreign languages, general 1101
Forensic science 1506
Forestry 0114
Forestry technologies 0116
French 1102
Fruit production 0108

Game management 0107
General liberal arts and sciences (interdisciplinary) 4901
Genetics 0422
Geochemistry 1915
Geography 2206
Geological engineering 0911
Geology 1914
Geophysical engineering 0912
Geophysics 1916
German 1103
Government 2207
Greek, classical 1110
Guidance, education 0826

Health care administration 1202
Health education 0837
Health professions, general 1201
Hebrew 1111
Helping services 2104
Higher education, general 0805
Histology 0413
History 2205
History of education 0821
Home decoration 1302
Home economics, general 1301
Home equipment 1302
Home management 1304
Horticulture 0108
Hospital administration 1202
Hotel management 0508
Humanities and social sciences (interdisciplinary) 4903
Husbandry, animal 0104
Husbandry, dairy 0105

Ichthyology 0499
India studies 0303
Indian (Asiatic) 1113
Industrial arts education 0839
Industrial engineering 0913
Industrial psychology 2008
Industrial relations 0516
Information sciences 0702
Information sciences, general 0701
Information systems 0702
Inorganic chemistry 1906
Institutional management 1307
Instruction 0829
Insurance 0512
Interior decoration 1009
Interior design 0203
International business 0513
International public service 2106
International relations 2210
Investments 0505
Islamic studies 0306
Italian 1104

Japanese 1108
Jewelry 1009
Journalism 0602
Junior college education 0806
Junior high school education 0804

Kindergarten education 0823
Korean 1199

Labor relations 0516
Landscape architecture 0204
Latin 1109
Latin American studies 0308
Law enforcement 2105
Law, general 1401
Learning theory 0822
Liberal arts and sciences (interdisciplinary) 4901
Library science, general 1601
Limnology 0499
Linguistics 1505
Literature, comparative 1503
Literature, English 1502

Management, business 0506
Management, engineering 0913
Marine biology 0418
Marine engineering 0923
Marketing 0509
Materials engineering 0915
Mathematics, applied 1703
Mathematics, education 0833
Mathematics, general 1701
Mathematics, statistics 1702
Mechanical engineering 0910
Medical laboratory technologies 1223
Medical record librarianship 1215
Medical specialties 1207
Medicine, M.D. degree 1206
Metallurgical engineering 0914
Metallurgy 1920
Metalsmithing 1009
Meteorology 1913
Mexican-American cultural studies 2213
Microbiology 0411
Middle Eastern studies 0309
Military science 1801
Mineral engineering 0918
Mining engineering 0918
Molecular biology 0416
Molecular physics 1903
Music (liberal arts program) 1005
Music appreciation 1006
Music, composition 1004
Music education 0832
Music history 1006
Music, performing 1004
Music, theory 1004
Musicology 1006

Natural resources management 0115
Naval architecture 0923
Naval science 1802
Neurosciences 0425
Norwegian 1114
Nuclear engineering 0920
Nuclear physics 1904
Nursery science 0109
Nursing (baccalaureate and higher programs) 1203
Nutrition, scientific 0424

Occupational therapy 1208
Ocean engineering 0924
Oceanography 1919
Operations research 0507
Optometry 1209
Organic chemistry 1907
Ornamental horticulture 0109
Ornithology 0499
Osteopathic medicine, D.O. degree 1210

Pacific area studies 0314
Painting 1002
Paleontology 1918
Parasitology 0499
Park management 2103
Pathology, animal 0408
Pathology, human 0408
Pathology, plant 0404
Personnel management 0515
Petroleum engineering 0907
Petroleum refining 0906
Pharmaceutical chemistry 1910
Pharmacology, animal 0409
Pharmacology, human 0409
Pharmacology, plant 0405
Pharmacy 1211
Philology 1505
Philosophy 1509
Philosophy of education 0821
Phonetics 1505
Photography 1011
Physical chemistry 1908
Physical education 0835
Physical sciences, general 1901
Physical therapy 1212
Physics, general 1902
Physiological psychology 2010
Physiology, animal 0410
Physiology, human 0410
Physiology, plant 0406
Plant pathology 0404
Plant pharmacology 0405
Plant physiology 0406
Podiatry 1216
Political science 2207
Poultry science 0106
Pre-elementary education 0823
Programming, computer 0704
Psychology, clinical 2003
Psychology for counseling 2004
Psychology, developmental 2009
Psychology, educational 0822
Psychology, general 2001
Psychology, industrial 2008
Psychology, physiological 2010
Psychology, social 2005
Psychometrics 2006
Public address 1506
Public administration 2102
Public health 1214
Public utilities 0510
Purchasing 0509

Radio 0603
Radiobiology 0423
Radiologic technologies 1225
Range management 0117
Reading education 0830
Real estate 0511
Recreation management 2103
Regional planning 0206
Rehabilitation services 1222
Religious education 2304
Religious music 2302
Religious studies 1510
Remedial education 0817
Restaurant management 0508
Rhetoric 1506
Russian 1106
Russian studies 0307

Safety education 0836
Sanitary engineering 0922
Sanskrit 1199
Scandinavian languages 1114
Science education 0834
Sculpture 1002
Secondary education, general 0803
Secretarial studies 0514
Securities 0505
Seismology 1916
Semantics 1505
Slavic languages (other than Russian) 1115
Slavic studies 0307
Social foundations of education 0821
Social sciences, general 2201
Social psychology 2005
Social work 2104
Sociology 2208
Soil conservation 0103
Soil management 0103
Soil science 0103
South Asian studies 0303
Southeast Asian studies 0304
Spanish 1105
Special education, general 0808
Special learning disabilities 0818
Speech 1506
Speech correction 0815
Speech pathology 1220
Statistics, mathematical and theoretical 1702
Statistics in psychology 2007
Student personnel 0826
Swedish 1114
Systems analysis 0705
Systems, information 0702

Teaching of English as a foreign language 1508
Technical education 0839
Television 0603
Textile design 1009
Textile engineering 0917
Textiles, home economics 1303
Theological professions, general 2301
Toxicology 0426
Transportation 0510
Transportation engineering 0908

Urban architecture 0205
Urban studies 2214

Vegetable production 0108
Veterinary medicine, D.V.M. degree 1218
Veterinary medicine specialties 1219
Vietnamese 1199
Vocational education 0839

Weaving 1009
West European studies 0312
Wildlife management 0107
Writing, creative 1507

Zoology, general 0407

Section II:

TECHNOLOGICAL AND OCCUPATIONAL CURRICULUMS LEADING TO ASSOCIATE DEGREES AND OTHER AWARDS BELOW THE BACCALAUREATE

Title *Code*

Accounting technologies 5002
Advertising design technologies 5012
Advertising technologies 5004
Aeronautical technologies 5302
Agriculture technologies 5402
Air conditioning technologies 5317
Airport management technologies 5004
Animal laboratory assistant technologies 5206
Appliance repair technologies 5310
Applied arts technologies 5012
Architectural drafting technologies 5304
Automotive technologies 5306
Aviation technologies 5302

Banking technologies 5003
Bible study 5502
Biological laboratory assistant technologies 5205
Broadcasting technologies 5008
Building technologies 5317
Business management technologies 5004
Business technologies, general 5001

Carpentry technologies 5317
Chemical technologies 5305
Civil technologies 5309
Commerce technologies, general 5001
Communications technologies 5008
Computer operator technologies 5104
Computer, peripheral equipment operation technologies 5104
Computer programmer technologies 5103
Construction technologies 5317
Corrections technologies 5505
Cosmetologist 5006

Data processing equipment maintenance technologies 5105
Data processing technologies, general 5101
Dental assistant technologies 5202
Dental hygiene technologies 5203
Dental laboratory technologies 5204
Diesel technologies 5307
Distribution technologies 5004
Drafting, architectural 5304

Education technologies 5503
Electrician technologies 5317
Electro diagnostic technologies 5217
Electromechanical technologies 5311
Electronics and machine technologies 5310
Engineering graphics 5303
Engineering technologies, general 5301
Environmental health technologies 5408

Finance technologies 5003
Fine arts technologies 5012
Fire control technology 5507
Fisheries technologies 5403
Food services technologies 5404
Forestry technologies 5403

Graphic arts technologies 5012

Health services assistant technologies, general 5201
Heating technologies 5317
Home economics technologies 5405
Horticulture technologies 5402
Hospital food service technologies 5404
Hotel management technologies 5010

Industrial management technologies 5004
Industrial technologies 5312
Inhalation therapy technologies 5215
Input preparation technologies 5102
Institutional management technologies 5218
Instrumentation technologies 5314
Insurance technologies 5004

Key punch operator technologies 5102

Laboratory technologies, general 5407
Landscape technologies 5402
Law enforcement technologies 5505
Library assistant technologies 5504
Lithography technologies 5009

Machine drafting and design technologies 5303
Machine repair technologies 5310
Marina equipment technologies 5004
Marine technologies 5406
Marketing technologies 5004
Mechanical technologies 5315
Mechanical technologies, general 5301
Medical assistant technologies 5214
Medical laboratory assistant technologies 5205
Medical office assistant technologies 5214
Medical record technologies 5213
Mental health aide programs 5216

Natural science technologies, general 5401
Newspaper communication technologies 5008
Nuclear technologies 5316
Nursing, practical (L.P.N. or L.V.N.) 5209
Nursing R.N. preparation 5208

Occupational therapy technologies 5210
Oceanographic technologies 5406
Ocular care technologies 5212
Office machine repair technologies 5310
Office machine training 5005
Ophthalmic technologies 5212
Optical technologies 5212
Optometric technologies 5212

Personal service technologies 5006
Personnel management technologies 5004
Photogrammetry technologies 5309
Photography technologies 5007
Physical therapy technology 5219
Plastics technologies 5305
Plumbing technologies 5317
Police technologies 5505
Printing technologies 5009
Programmer technologies 5103
Psychiatric technologies 5216
Public administration and management technologies 5508
Public health inspection technologies 5408
Public service technologies, general 5501
Public utility technologies 5011
Purchasing technologies 5004

Radio broadcasting technologies 5008
Radio repair technologies 5310
Radiologic technologies 5207
Real estate technologies 5004
Recreation technologies 5506
Religion related occupations 5502
Rest home management technology 5218
Restaurant management technologies 5010

Sales technologies 5004
Sanitation technologies 5408
Secretarial technologies 5005
Sheet metal technologies 5317
Social work related technologies 5506
Stewardess preparation 5006
Surgical technologies 5211
Surveying technologies 5309

Teacher aide preparation 5503
Television broadcasting technologies 5008
Television repair technologies 5310
Textile technologies 5313
Tool design technologies 5303
Transportation technologies 5011

Welding technologies 5308
Wildlife technologies 5403

X-ray technologies 5207

APPENDIX C

PROFILE OF INSTITUTIONS STUDIED

Each of the participating institutions was a state controlled coeducational university. Four are accredited by the Southern Association of Colleges and Schools, and the other is accredited by the North Central Association of Colleges and Secondary Schools. Three of the five schools have open enrollment policies.

The universities were established between 1860 and 1881. The fall 1976 enrollment was just over 12,000 at the smallest university and was 45,000 at the largest. The mean enrollment of the five schools was 26,066.

According to the 1970 census, the population of the states in which the universities are located ranges from approximately 2,000,000 to 11 million. In general the school with the smallest enrollment is located in the state with the smallest population, the next larger school in the state with the next larger population, etc.

The universities are very similar in tuition charges per academic year. The range was $400-$480 with a mean of $440.

Out of state students account for from 6 to 20 percent of the enrollment. The schools located in the three

states with the smaller populations had the highest proportions of out of state students.

APPENDIX D

SOUTHERN UNIVERSITY GROUP OF 25
FACULTY TEACHING LOAD DATA EXCHANGE
FALL 1975

Institution _____ FICE Code _____
name

School/Department/HEGIS			Student Credit Hours Taught by All Instructional FTE Faculty											Instruct'l FTE Faculty			Research and Other FTE Faculty			Total FTE Faculty		
			Student Level						Course Level													
School/ College	Depart-ment	Primary HEGIS Code	FR-SO	JR-SR	1st PROF	MAST/ GRI	DOCT/ GRII	TOTAL	LOWER DIV	UPPER DIV	MIXED	1st PROF	GRAD	Ranked	Other	Total	Ranked	Other	Total	Ranked	Other	Total

Footnotes/Comments: _____

SOUTHERN UNIVERSITY GROUP OF 25
FACULTY TEACHING LOAD DATA EXCHANGE
FALL 1976

Institution _____ FICE Code _____
Name

School/Department/HEGIS			Student Credit Hours Taught Instruct'l FTE Faculty								Instruct'l FTE Faculty			Research and Other FTE Faculty			Total FTE Faculty		
			Student Level*																
School/ College	Depart-ment	Primary HEGIS Code	L.L. FR-SO	U.L. JR-SR	TOTAL UNDERGRAD	1st PROF	MAST/ GR I	DOCT/ GR II	TOTAL GRADUATE	GRAND TOTAL	Ranked	Other	Total	Ranked	Other	Total	Ranked	Other	Total

Footnotes/Comments:* _____

APPENDIX E

SOUTHERN UNIVERSITY GROUP OF 25
FACULTY TEACHING LOAD DATA EXCHANGE
CREDIT ENROLLMENT_____FALL 197____

Institution Name_____ HEGIS TAXONOMY CODE

FICE Code_____ ____ Primary

College/School_____ ____ ____

Department_____ ____ ____ Others

Student Credit Hours
- ☐ Semester hours
- ☐ Quarter hours

FTE Basis
- ☐ Activity Analysis
- ☐ Budget Allocation
- ☐ Contact Hour
- ☐ Section Credit
- ☐ Other_____

Measure	Sub-Set	Student Level					Total	Course Level				
Student Credit Hours	Total	Lower Fr. So.	Upper Jr.Sr.	1st Prof.	Masters	Doct.		Lower Div.	Upper Div.	Mixed	1st Prof.	Grad.
Instructional FTE Faculty	Ranked Faculty											
	Others											
	Total											
Other FTE Faculty, State Funds	Ranked Faculty											
	Others											
	Total											
Total	Ranked Faculty											
	Others											
	Total											

APPENDIX F

SAMPLE PRINTOUT OF RAW DATA

HEGIS=400

COUNT	INST	SCH RFTE	RANKFAC	SCH TFTE	RANKTOT	MSCH R	SDSCH R	SDSCH T	MSCH T
1	UNIV9	471	1	287	4	388	78.7567	42.4946	297
2	UNV12	444	2	311	3				
3	UNIV1	404	3	329	2				
4	UNIV8	399	4	346	1				
5	UNIV6	370	5	260	6				
6	UNIV2	275	6	225	7				
7	UNIV3	266	7	266	5				
8	UNIV4								
9	UNIV5								
10	UNIV7								
11	UNV10								
12	UNV11								
13	UNV13								
14	UNV14								

HEGIS=401

COUNT	INST	SCH RFTE	RANKFAC	SCH TFTE	RANKTOT	MSCH R	SDSCH R	SDSCH T	MSCH T
1	UNV10	698	1	570	1	385	141.497	117.77	306
2	UNIV9	575	2	306	5				
3	UNV11	480	3	480	2				
4	UNIV1	446	4	360	3				
5	UNIV8	399	5	346	4				
6	UNIV4	394	6	296	6				
7	UNIV6	370	7	260	8				
8	UNIV2	275	8	225	9				
9	UNIV3	266	9	266	7				
10	UNV13	258	10	183	10				
11	UNIV5								
12	UNIV7								
13	UNV12								
14	UNV14								

HEGIS=402

COUNT	INST	SCH RFTE	RANKFAC	SCH TFTE	RANKTOT	MSCH R	SDSCH R	SDSCH T	MSCH T
1	UNIV5	537	1	324	3	300	168.962	126.279	226
2	UNV12	495	2	342	2				
3	UNV10	372	3	372	1				
4	UNV14	117	4	97	4				

APPENDIX G

THE ASSOCIATION FOR INSTITUTIONAL RESEARCH

P.O. Box 7518, The University of Texas at Austin, Austin, TX 78712

Executive Office:
4071 Stone Building
Florida State University
Tallahassee, FL 32306
Telephone: (904) 644-4470

January 31, 1978

Stephen W. Ahrens, Graduate Research Assistant
Louisiana State University System
99 University Lakeshore Drive
Baton Rouge, Louisiana 70803

Dear Mr. Ahrens:

The 1978 Contributed Papers Committee has completed its review of the many proposals which were submitted for consideration as possible presentations at this year's Annual Forum in Houston. Your paper is among those which the committee has selected for formal presentation part of the program.

Listed below are the salient facts about the portion of the program containing your presentation. The author(s) of each paper will be allowed a total of approximately thirty minutes for presentation.

Wednesday, May 24, 1978 2:00 p.m. - 3:30 p.m.

CONCURRENT CONTRIBUTED PAPERS SESSION #6
Chairperson: Dr. Donald M. Norris, Assistant Director, Office of Institutional Studies, The University of Texas at Austin

"Changes in Degree Output, 1971-1976: National Summary Data and Selected Program Case Studies." James R. Mingle, Research Associate, Southern Regional Education Board.

"A Longitudinal Study of Grades in 144 Undergraduate Courses." James E. Prather, Research Associate, Georgia State University.

"An Interinstitutional Analysis of Faculty Teaching Load." Stephen W. Ahrens, Graduate Research Assistant, Louisiana State University System.

VITA

Stephen William Ahrens, son of John and Mary Cummings, was born in Portland, Oregon, on September 11, 1948. Having attended various elementary and secondary schools throughout the Eastern states, he graduated from Baltimore Polytechnic Institute (Maryland) in 1966.

Following graduation from New Mexico State University in 1970 with a B.S. in Secondary Education, he was on active duty with the U.S. Army and saw twelve months duty in the Republic of Vietnam.

In 1972 he took a part-time position teaching journalism at Strong High School (Arkansas). The following year, he accepted a position as social studies teacher at Parkers Chapel High School in El Dorado, Arkansas, where he remained for three years. During that time, he attended the University of Arkansas and received the M.Ed. in Educational Administration in 1976.

He held a teaching assistantship at Northeast Louisiana University in 1975-76 and the succeeding year he accepted a graduate research assistantship with the System Office of Institutional Research at Louisiana State University. While at LSU, he also taught research methods for the Juvenile Police Officer's Institute and engaged in statistical consulting for various research studies.

Currently, he is the research director for the Iowa State Education Association specializing in higher

education impasse negotiations, as well as, being in charge of the computer facilities. He is married to the former Sara Jane Head and has a five year old daughter, Stephanie Leigh.

EXAMINATION AND THESIS REPORT

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Major Field: Education

Title of Thesis: An Interinstitutional Analysis of Faculty Teaching Load

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